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# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

Industry Spotlight

## PCMs Braving Ups and Downs In Disk Market

By Marcia Blumenthal
CW Staff

With product life cycles lasting only about four to five years, the IBM plug-compatible disk market is highly volatile.

Through 1976, virtually 100% of plug-compatible disk revenue was from 3330-type products, but last year only 3.4% of revenues were derived from these products, according to James M. Porter, publisher of the annual "Disk Trend Report."

Much the same fate awaits the 3350, introduced by IBM in 1976. This year the 3350 will comprise 94% of plug-compatible manufacturer (PCM) revenue, but those drives will not even be in production in three years, Porter predicted.

IBM's introduction of its 3380 drive in June with thin-film technology heralded the new generation of disk drives that will replace the 3350. These high-end disk systems offer PCMs the most promising new business area, Porter maintained.

By contrast, IBM's 3370 and 3310 models announced in conjunction with the 4300 last year are not PCM bailiwicks because of the low profit margins that sales of those drives would bring, noted Harry Henry, director of equipment research and services at International Data Corp. (IDC). To date there are no PCM alternatives for those drives, he added.

### PCM Market Share

The total 70,000 3350-type spindles installed in the U.S. today, PCMs hold about 25% to 30% of the market, with more than 20,000 spindles installed, various sources estimated. By 1980, a total of 90,000 units will be installed, a 28% increase, IDC forecast.

Worldwide PCM revenues for 1980 will be about $406 million, with 3350-type drives garnering sales of $380 million, Porter estimated.

Revenue growth for this year will be about 14%, Porter predicted. However, next year revenue will slip 15% behind the 1980 level, Porter noted, attributing the decline to fallout from the 3380

(Continued on Page 6)

Wide World Photos

## Crossing Tacks

The 12-meter yacht Clipper crosses tacks with Freedom during the America's Cup trials in Newport, R.I. Both vessels were aided by onboard micros. Story on Page 9.

## 'Function Points' Described As Productivity Measure

By Bruce Hoard
CW Staff

FARMINGTON, Conn. — Productivity measurement is not as important as timely, cost-effective applications development, IBM information systems adviser Allan J. Albrecht said here recently.

For this reason, IBM's DP Services Division employs a "phased approach" and disciplined management techniques to assure high productivity rather than measuring lines of code. However, it also uses "function points" or "function value" to help maintain high performance and competition among programmers and to help measure productivity.

Albrecht described IBM's productivity management techniques at the fifth meeting of the New England Productivity Information Exchange Roundtable (Pier). The techniques he discussed are intended for use in large-scale applications development for such organizations as banks and insurance companies, he said.

"Lines of code are not reliable for measurement because they have widely differing values depending on the technology used," he said. However, they can be used as a secondary measure to provide a basis for comparing projects using the same language, he noted.

### Function Values Defined

Function values consist of the number of inputs, inquiries, outputs and master files delivered for each project.

These counts are weighted by numbers designed to reflect their functional value to the customer. The results are then adjusted to reflect other factors such as complexity.

(Continued on Page 4)

## Surprise Move Puts MIS Staff On Union Rolls

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — Management information systems (MIS) workers at Western Airlines, Inc. are being forced to unionize, whether they like it or not.

A recent decision by a federal agency in Washington, D.C., has made union membership all but a certainty for more than 100 computing professionals at the airline.

The employees, none of whom had ever solicited admission to a union in the first place, were taken by surprise at the news that their department is likely to be coopted for the first time by the organized labor movement.

Much of the groundwork for unionizing Western's MIS personnel was laid last fall by the Brotherhood of Railway and Airline Clerks (Brac), an international labor union that until recently represented an estimated 80% to 90% of the airline's total work force.

### Brac Petition

In September 1979, Brac petitioned the National Mediation Board (NMB), an independent federal agency, to expand the union's sphere of influence to include all of Western's nonsupervisory MIS personnel, who at the time were still nonunionized. In its petition, Brac argued that because nonsupervisory computing employees exercise no management authority, they deserve to be grouped in the same job classification as clerical and other nonmanagerial office personnel.

Brac also argued that, because it already represented the rest of Western's nonmanagerial office employees, it should be granted authority to do likewise with their "clerical" counterparts in MIS.

The NMB agreed with Brac's contentions, and on May 28, it accepted the union's petition, which specified 11 MIS job categories to fall within the labor organization's domain. The designated categories exclude supervisory personnel like MIS managers or directors, but they do apply to computing-room subordinates like programmer trainees, programmers, systems ana-

(Continued on Page 4)

## DEC-20 Services Found Cheaper

By Tim Scannell
CW Staff

STAMFORD, Conn. — Local users of Digital Equipment Corp. DEC-20-based time-sharing services are probably getting more for their computing dollar than users of services with IBM or Control Data Corp. systems, according to a report just released by Real Decisions Corp. (RDC).

The 269-page *Timesharing Decisions* report spotlights 22 remote computing

(Continued on Page 2)

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# Cambex Unwraps Mid-Range CPUs

By Rita Shaw
CW Staff

WALTHAM, Mass. — Cambex Corp., which until last week was known as Cambridge Memories, Inc., (CMI), has announced several IBM plug-compatible mid-range processors.

The 1636 is intended as a replacement for IBM's 4331 Group 2 mainframe and the 1641 is meant to compete with IBM's 4341. A third member of the family, a 1651, is expected to be available as a field upgrade for either model in the second half of 1981 and completes Cambex's 1600 series.

An earlier version of the 1636 was actually introduced about two years ago [CW, Aug. 28, 1978] as a CMI Model 3 alternate to the 370/135.

IBM's 4300 series announcement in February 1979 caused CMI to reassess its marketing strategy, and the CMI models 1 and 2 were never pushed, a spokesman said.

The 1636 is available with a maximum of 4M bytes of main memory and offers a 15% performance improvement over the 4331 Group 2 machine, Cambex claimed.

Standard I/O channels include a one-byte multiplexer for all models in the series, up to four block multiplexer channels (in increments of two) for the 1636 and 1641 processors and a maximum of five block multiplexer channels for the 1651. The maximum block multiplexer data rate is 1.86M byte/sec and maximum byte multiplexer rates are 50K byte/sec in byte mode and 180K byte/sec in burst mode.

### Storage Capacity

The 1M-byte 1636 can be expanded to 4M-bytes of main storage and the larger 1641 can be expanded from 1M byte to 8M bytes to offer twice the memory capacity as IBM's 4341, the company spokesman noted.

The high-end 2M-byte 1651 can also be expanded to 8M bytes and compares favorably to IBM's 370/158-3 in terms of performance, he claimed. Specifications for the 1651 include a 50-nsec machine cycle time as opposed to the 115 nsec specified for the IBM 370/158-3 [CW, Jan. 8, 1979].

A typical 1M-byte 1636 processor costs $125,000 with a 2M-byte 1641 mainframe priced at $190,000.

Both of these processors can be upgraded to 1651 specifications; the vendor said. The field upgrade packages for converting a 1636 or 1641 to a 1651 cost $160,000 and $92,500, respectively. Upgrading the 1636 to a 1641 costs $70,000 and all upgrade packages will be available for delivery in the second half of 1981. Cambex said from its headquarters at 360 Second Ave., Waltham, Mass. 02154.

# DEC-20 Services Found Cheaper

(Continued from Page 1)

vendors and details the results of benchmarks individually run on each service. Performed by RDC personnel earlier this year, the benchmarks were split evenly between Fortran and Basic programs and test the computational power and I/O handling capabilities of each service.

The report also lists the various networks utilized by each remote computing service vendor, the type of computer languages available with the service, whether the vendor offers external data bases for specialized applications, and each vendor's pricing structure.

The results of RDC's efforts: If you are using a DEC-20 time-sharing service, such as American Management Systems, Inc. or Citishare, you are probably paying about 67 cent/hour for Basic CPU time and 89 cent/hour for Fortran processing. This compares with about $2.75/hour and 93 cent/hour for Basic programs on IBM and CDC equipment, respectively, and $4.57/hour and $1.55/hour for Fortran routines, according to the firm's benchmark tests.

DEC-10 remote computing vendors were also surveyed in the report and faired relatively high in the CPU intensive portion of RDC's benchmarks. For instance, users of DEC-10 services are charged about $2.51/hour for programs run in Basic and $2.77/hour for Fortran.

The CPU intensive benchmarks, designed to test processing power, involved a variety of calculations including addition, multiplication, division, square root and exponentiation. All of the benchmarks were run on 30 char./sec terminals located at the company's Cherry Hill, N.J., offices, a spokeswoman stated.

The RDC report also compared the average costs charged by each of the 22 services for connect and storage facilities. For example, if you are a DEC-20 time-sharing user, you are probably paying about $6.75/hour for local prime connect time, with a 15 char./sec transmission rate. This compares with an average $11.80/hour charged by such IBM-based vendors as National CSS, Inc. and Tymshare, Inc. and $12.94/hour charged by CDC-based companies like CDC's Cybernet and United Computing Systems, Inc.

In most cases, DEC-20-based firms led the low-price pack for charges on disk storage space. The DEC-20 companies sell space at a rate of 22 cents per 1,000 char./mo for the first to 5Mth char. and 17 cents for any storage above 25M char. By contrast, IBM-based services charge 26 cents and 19 cents, CDC bills users 26 cents and 16 cents and DEC-10 firms charge 55 cents and 28 cents, respectively, per 1,000 char./mo.

*Timesharing Decisions* costs $695 plus postage and handling from the company at 123 High Ridge Road, Stamford, Conn. 06905.

# This Week

**NEWS**

RDS Adds Rayrat Communications Processor ..... 5
Plug-Compatible Storage Leaders Down to Four ... 6
STC Holds Lion's Share ..... 7
PCMs More Successful with Tape Than Disk ..... 8
Micros Join Two Crews in America's Cup Trials ..... 9
User Attitudes: What They're Planning ..... 10
DEC Adds 300M-Byte Drive, Cartridge System ..... 13
Managers Warned of Contract Programmers ..... 14
House Earnings This Week on Revamping FAA ..... 15
IBM Asks Gas Ration Priority for Service Staff ..... 17
Consultant Sees Era of Implementation Ahead ..... 18
Los Angeles Pulls Through Three-Day Strike ..... 18
FCC Hears Further Comments on Inquiry II ..... 20
Belgian Sentenced, Fined in Adabas Bribe Case ... 22
COG Gets Local Government Forecasts Rolling ... 23
Videocassette Courses Set For User Needs ..... 27
Courseware Exchange Enrolls Schools ..... 28
Datapro Sets Seminar Series ..... 30
North Star Horizon Excels in Performance ..... 31

**EDITORIAL**

Editorial: The Hacker Mentality ..... 32
Reader Commentary: FAA Editorial Biased ..... 33
Reader Commentary: Systems Career Harmful? ... 33
Sociology of Computing: Perusing the Symptoms? . 33
Human Connection: Trade Press on Track? ..... 34
The Taylor Report: NCR User Missing Crux ..... 40

**SOFTWARE & SERVICES**

Lawyer Briefs Legal Side of Acquisitions ..... 41
DBMS Offers IDMS Analyzer ..... 42
Tektronix Adds Statistical Programs ..... 46
Word Processing Aid Handles PDP-11s, LSI-11s .. 48
HP 3000 Users Offered Report Generator ..... 50
'Selector IV' Uses Dedicated, Integrated Tasks .... 54

**COMMUNICATIONS**

POS Units May Save Ohio $43 Million ..... 55
NCR 279, IBM 3270 Linked to System/34 ..... 58
IDS Enhances Tech Control Center ..... 62
Asynchronous Unit Debuts ..... 64

**SYSTEMS & PERIPHERALS**

Graphics Week '80 Draws Few Exhibitors ..... 66
IBM-Compatible Floppy Has RS-232C Interface ... 68

**MINIWORLD**

Selection Should Go Beyond Logical Analysis ..... 67
IBC System 40 Upgraded to 128 Bytes ..... 68

**COMPUTER INDUSTRY**

Time Is Hot on the Side of Time Brokers ..... 71
Computer Associates Tells Boom Story ..... 71
Vendors Say No to Computing Museum ..... 72
Henriques Urges Tax Breaks as R&D Incentive .... 75
Time Working Against Computer Time Brokers ... 76

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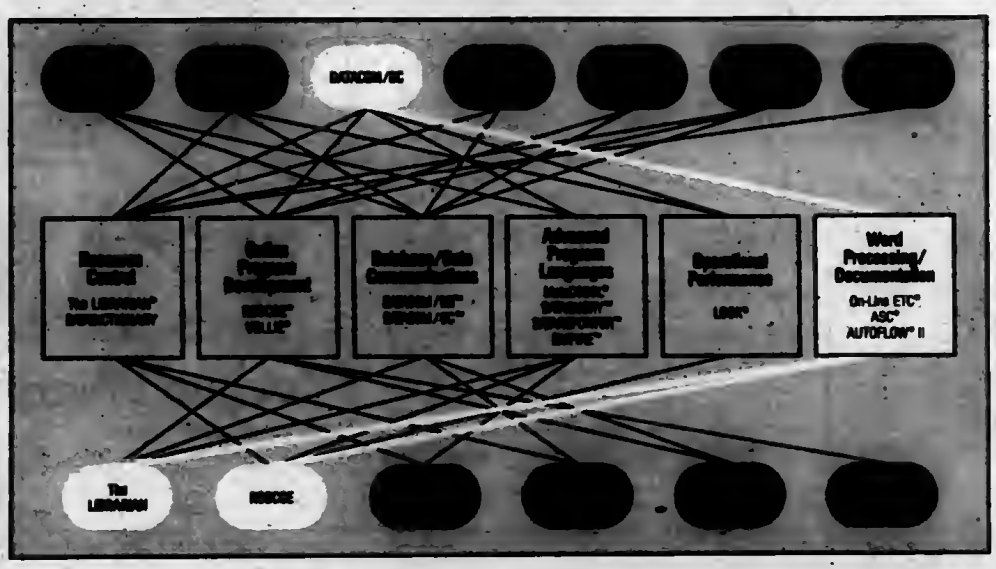


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# MIS Workers Forced Into Clerical Union

(Continued from Page 1)

lysts and technical specialists of almost every stripe.

### Not Consulted

At no time during the NMB's nine-month evaluation of Brac's petition were the members of Western's MIS department in any way consulted. The federal agency simply never asked the employees how they felt about being classified as "clerical and office" personnel or what they thought of the prospect that they might soon be joining a union, according to Western's systems analyst Elizabeth Davidson.

So when members of the company's computing department finally learned of the NMB's petition decision on June 4, they greeted the news with a mixture of astonishment, anger and resentment. Although no one has yet formally accused the NMB of acting improperly or exceeding its authority, Western's MIS employees have nevertheless roundly criticized the federal agency for denying them a chance to voice their opinions on an issue that profoundly affects their future, Davidson said.

The NMB, for its part, concedes it never informed Western's MIS employees of Brac's intention to unionize them, but the agency still insists its actions in the case were justified.

Like its MIS personnel, Western's management also strongly disapproves of attempts to unionize its formerly independent computing shop.

In early June, shortly after learning that the Brac petition had been approved, Western's management responded to the decision by submitting a petition of its own. In essence, the petition asked the NMB to reverse its earlier ruling that places members of the company's MIS department in the same job category as clerical and office personnel. But on June 23, the managementappeal was refused.

The NMB's rejection reportedly ended Western's last realistic hope of blocking a union takeover.

### 'Dangerous Precedent'

In Davidson's view, the involuntary unionization of Western's MIS department sets a "dangerous precedent" and holds grave implications, not just for the company itself, but for the rest of the airline industry as well.

The conditions that precipitated a unionizing effort at Western could easily be duplicated — with similar results — at almost any other airline, the systems analyst warned. A carrier whose MIS department looks particularly vulnerable to a unionizing drive right now is Continental Airlines, Inc., which just last Aug. 8 announced that it and Western have agreed to merge soon.

The roots of the effort to unionize Western's MIS personnel can be traced back more than a year ago to an internal Brac membership dispute. At the time, many of the union's members had grown so disaffected with the organization's leadership that they called an election to decide whether they would continue to be represented by Brac or whether they would switch their allegiance to a new, independent union called the Air Transport Employees Association (ATEA).

To delay the election as long as possible and perhaps even sway its outcome, Brac sought to enlarge its universe of eligible voters by including Western's MIS personnel as part of the union's membership, Davidson said.

The apparent ploy proved only marginally successful, however, because last month the requested election was finally held, and on July 30 the results were at last announced: Brac had been voted out as Western's official labor representative in collective bargaining, and the new union — the ATEA — had been resoundingly voted in. So only about two months after being forced to join their first union, Western's computing employees found themselves involuntarily switching to a second one.

Actually, the MIS employees' ATEA membership isn't expected to become complete and formalized until the union and Western's management finish negotiating a new contract — a process that will probably continue for some time to come.

# Price Cut 14% On HP 3000 III

PALO ALTO, Calif. — Hewlett-Packard Co. has dropped the price of its HP 3000 III business computer 14% and is offering its Cobol II/3000 compiler free to purchasers of any HP 3000 computer through Oct. 31, the company announced last week.

The new U.S. list price for the 256K-byte system — HP's most powerful business computer — is $92,000, down from $107,330. The normal, one-time license fee for the Cobol II/3000 compiler is $3,000.

HP linked the price decrease to more efficient production methods.

The Series III is composed of the CPU, 256K-bytes of fault control memory, a 50M-byte disk drive, a 1,600 bit/sec magnetic tape drive, 16 asynchronous terminal ports and a system CRT console.

Included with Series III Software is the Image data base management system, the MPE-III operating system, Query inquiry language, Ksam file access and V/3000 forms and data entry subsystem. More than 2,500 Series IIIs have been shipped to date, the spokesman said.

HP is offering the Cobol II/3000 compiler at no charge as part of an effort to introduce, customers to the microcode-assisted implementation of Ansi Cobol, he added.

# 'Function Points' Described

(Continued from Page 1)

"This gives us a dimensionless number defined in function points which we have found to be an effective relative measure of function value delivered to our customer," he declared.

However, interesting though they may be, function points are secondary to the less exotic principles of punctuality and controlled spending when it comes to applications development, Albrecht said.

### IBM Approach

IBM's "phased approach" involves two phases. The first, system design, consumes 20% of total development man-hours. The second, system implementation, absorbs the other 80%.

All projects are carried out under a project management system which features a flowchart depicting its fundamental processes. The approach uses disciplined management techniques including periodic feedback checks to keep the project on course.

The first such feedback loop assesses the project risk with a 20-item questionnaire. It is followed by preparation of a project objectives document which is reviewed by both an independent systems assurance group and the customer to make sure both sides understand what is to be done, Albrecht said.

The project is then planned in detail and its progress checked once a week. Results are shared with the customer. The systems assurance group also conducts an overall review every six months, he added.

### 'Flexible But Firm'

Throughout the process, a "flexible but firm" change control approach is taken because "you can't be locked into an unbreakable straightjacket for the 12 to 24 months it takes to complete a system," Albrecht said.

As each project is finished, a completed project document is prepared. This document is extremely important, he stressed, because it includes the project's most positive and negative points as noted by the project manager. It may then be used as a guide for future projects.

If all the rules were followed and the project was completed on time and within budget, the customer should be satisfied.

Albrecht used a productivity time trend chart to back his contention that the DP Services Division has consistently increased its productivity. It was based on 22 development projects conducted over 4-1/2 years.

The chart revealed progressively fewer hours spent on generating each function point for Cobol, PL/I and DMS/VS projects during the time period involved. The productivity improvement was about three to one, or a 25% compounded productivity increase per year.

"Although with only two projects, there is too little data here to draw conclusions, the initial indication on DMS/VS is that it is probably more productive than either PL/I or Cobol," he said. "If this trend is confirmed, DMS/VS could prove to be about 30% more productive than Cobol."

No one other than IBM is currently employing Albrecht's function value measurement methods, he said.


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## *And Preemptive Operating System*

# RDS Adds Raynet Communications Processor

By Brad Schultz
CW Staff

NORWOOD, Mass. — A communications processor that allows data network users to access remote applications regardless of hardware protocol commitments along the way was announced last week by Raytheon Data Systems Co. (RDS) for its Raynet customers.

The vendor also introduced the Preemptive Communications Operating System (Pcos), which reportedly lets Raynet users assign 256 separate priorities to "a virtually unlimited" number of tasks. Both products launch Phase 2 of the Raynet concept for decreasing the number of front-end processor ports in a network by remotely concentrating many communications lines into a few.

Replacing the RDS-500 communications processor, the RDS-7500 has a main memory size ranging from 65K to 262K bytes. This processor features a set of 130 instructions for a 22-bit word length subject to a 700-nsec cycle time. With 12 hardware registers, eight general-purpose registers and 16 interrupt priority levels, the RDS-7500 offers a maximum I/O data rate of 45 million bit/sec, a spokesman said.

### Operating System

Replacing the Communications Operating System (COS), Pcos supports interprocessor and I/O control, he added, as well as task, file and memory management. Accompanied by system initialization routines and both debug and reconfiguraton utilities, Pcos also supports multiprocessor operations in a manner claimed to prevent network crashes as the result of a single component failure.

Further, the operating system works with the RDS Inter-Processor Bus (IPB) architecture and Modem Switching Device, which are said to boost Raynet's overall reliability by smoothly engaging alternative circuitry in the event major network components fail. And Pcos features periodic task scheduling, inserting selected tasks in the job queue automatically as predefined events occur or at preset time intervals.

That amounts to another way of raising the priority of tasks whose present rating keeps them in limbo for prolonged periods, he pointed out. Raynet applications software includes packages for network management, connection management and I/O message processing.

A queue processing package gives Raynet users store-and-forward message switching, and a system recovery package offers trouble-shooting expedients.

Basically, Raynet was designed to give a single network node power to manage remote resources and choreograph consolidations of data flow while reducing host communications overhead. By translating protocols, Raynet communications processors such as the RDS-7500 hand the user considerable license to reshuffle the positions of terminals and other communicating peripherals.

These processors' capabilities for remote line concentration also trim the user's need for additional front-end hardware as traffic volumes swell. And the various message-switching features facilitate integration of data and text flows.

RDS now markets five upward-compatible computer systems to drive Raynet that are based on its line of communications processor. The Raynet/I system offers remote line concentration. Raynet/II adds a capacity for network consolidation by giving terminals access to a wide range of the network's mainframes and applications software.

Raynet/III extends the offerings of Raynet/I and II to include protocol translation. Raynet/IV adds message switching. The most sophisticated system, Raynet/V, opens channels between the mainframes and terminals of two or more network nodes.

Raynet/I, II and III are already installed; deliveries of Raynet/IV will begin this October; and Raynet/V shipments will commence in mid-1981, the spokesman noted. A single Raynet/I costs $59,200 or leases for $1,900/mo on a five-year plan.

Rigged to drive 62 "high-speed" lines, a 392K-byte dual-processor Raynet/I with multiplexers, line adapters, modem switching devices, program load device storage, dual operator consoles and printers costs $360,000. Its five-year lease goes for $10,000/mo.

A division of Raytheon Co., Raytheon Data Systems is located at 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

## Correction

Two high-speed channels from Amdahl Corp. will be provided in each four-channel group on the vendor's 470V/7 series and V/8 rather than on the 470V/6 and V/8 [CW, Aug. 11]. Only one high-speed channel is provided for each four-channel group on Amdahl's 470 V/5 and V/6 product line.


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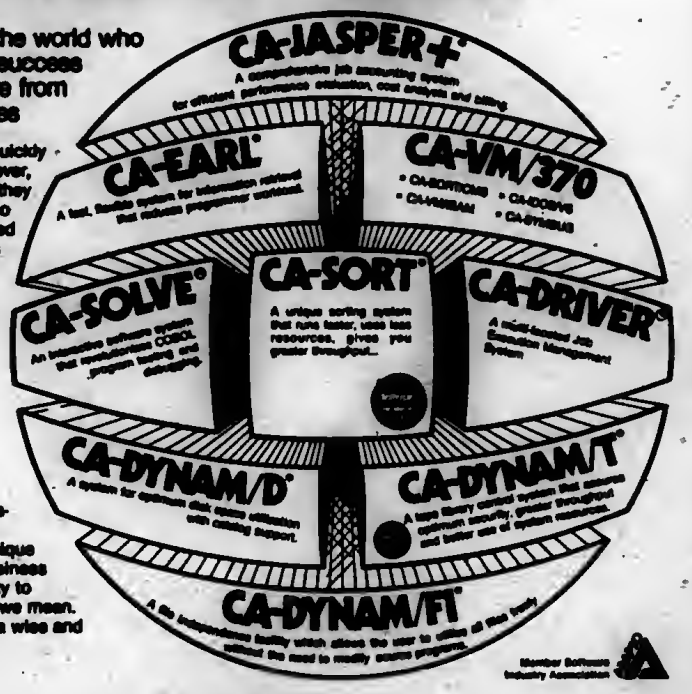


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# Plug-Compatible Storage Leaders Down to Four

Today the IBM plug-compatible disk and tape market is dominated by four companies, but during the early 1970s there were 15 companies competing in this arena.

What happened to them? In September 1970, IBM introduced its 2319A series, embedding the controller into the box with the storage units. Many vendors did not manufacture controllers, Frank Kline, vice-president of research with Drexel Burnham Lambert, Inc., recalled.

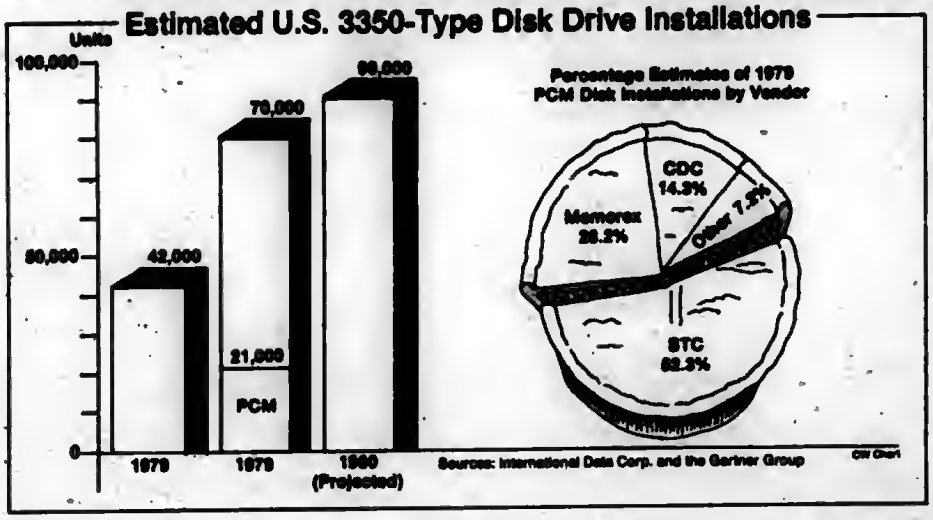
Later that year, IBM essentially reduced the cost of its leases by eliminating the charge of using its storage equipment for more than one shift.

With the introduction of the 2319B series, IBM reduced lease prices on its disks by 8% to 16%, Kline noted. IBM made up for some of this decrease by hiking the price of its CPU by 3% to 9%, he said.

Although several vendors, among them Memorex Corp., Telex Corp. and California Computer Products, Inc., brought antitrust suits against IBM, these companies failed to prove that IBM dominated the market, Kline noted.

The companies that withdrew from the plug-compatible storage market are:

- Ampex Corp.
- Bucode, Inc.
- Calcomp.
- Marshall Data Systems.
- Mohawk Data Sciences Corp.
- Potter Instrument Co.
- Singer/Frieden Division.
- Texas Instruments, Inc.
- Tracor/Peripherals General, Inc.
- XLO/Bryant Computer Products.




# PCMs Braving Ups and Downs in Disk Market

(Continued from Page 1)

introduction. But by 1982 a recovery will begin, with a 16% revenue growth, and 1983 will be a boom year with an 84% revenue spurt, he predicted.

### Storage Prices

While revenue growth will be sporadic during the next few years, storage prices per 1M byte have fallen steeply. During the 1960s, mass storage cost about $25 per 1M byte, but fell below $1 per 1M byte with the introduction of the 3380, not including the control unit or other features.

On a two-year lease plan, IBM disk storage for the 3380/B04 (storage unit only) costs 71 cents per 1M byte per month, an IBM spokeswoman said. With the controller and fixed-head option, the monthly price per 1M byte ranges from 86 cents to $1.25.

For the basic 3350 storage device, IBM's current monthly price per 1M byte on a two-year lease program is $1.48, with a range of $1.87 to $2.39 with the controller and fixed-head option (see chart on Page 7).

### Leading Competitors

Leaders in the plug-compatible disk market are Storage Technology Corp. (STC) which, according to Porter, last year held 39.8% of the installed 3350s. Next is Memorex Corp., with 27.6%, and Control Data Corp., with 19.9% of installed 3350-type units.

By contrast, STC in 1978 held 49.6% of the 3350-type installations, with Memorex claiming 21.2%. CDC has increased its share significantly in the past couple of years, he said. (Differences between "Disk Trend Report" figures and those in the accompanying chart vary, possibly by year compiled.)

With the technology and products changing so rapidly, those surviving plug-compatible vendors have done so by adapting quickly to technology changes and often developing products that differ from the IBM counterpart.

However, this was not always the case. Between 1968 and 1973 there were 13 PCM competitors in the disk

## Industry Spotlight

market. However, with IBM price cuts on its models 2319A and B in the early 1970s, competitors fell by the wayside, Frank Kline, vice-president of Drexel Burnham Lambert, Inc., explained.

Unlike IBM, CDC, Memorex and STC all offer double-density 3350-type devices. IDC's Henry estimated about 50% of plug-compatible disk orders are for these double-density models.

How long it will take the major plug-compatible disk makers to match IBM 3380 technology is unclear. Historically, independents have dovetailed with IBM's new products within 18 months, Porter noted.

Both Memorex and STC have said they have thin-film technology. During interviews shortly after IBM's 3380 introduction, the major independents said they would announce competitive products [CW, June 16].

Aside from technology, IBM's 3380 is highly price-competitive, especially on the two-year lease, analysts have observed. This will squeeze independents' earnings. Some observers question Memorex's ability to remain competitive in the plug-compatible disk business. Despite a first-half loss of $20.6 million, Memorex asserted it will remain in the business.

Whether or when there will be a shakeout in the market from the 3380 introduction is currently unknown. In the interim, there will be a market for 3350s during 1981, but PCM shipments will decline next year, Porter forecast. The number of drives PCMs are able to sell depends on the number of 3380s IBM is able to sell and produce, he said.

# • Memorex Stretching Itself Thin? •

SANTA CLARA, Calif. – Posting a loss of about $21 million for its current fiscal year to date, Memorex Corp. is scrambling for a steady footing.

Some industry analysts have suggested Memorex may have stretched itself too thin by offering too many products. They also questioned the company's ability to compete in the end-user IBM-compatible marketplace.

Despite this speculation, Memorex last year managed to claim more than 27% of 3350-type disk shipments, according to James M. Porter, publisher of "Disk Trend Report." He estimated Memorex's 1979 plug-compatible disk revenue at $97.5 million, or 20% of the company's total equipment sales of $490.8 million.

Although Memorex offers the full range of IBM-compatible 3420-type tape drives, these are purchased from Fujitsu Ltd. for resale rather than manufactured in-house. Besides plug-compatible disks and tapes, Memorex sells OEM disk products, communications controllers, terminals, memory products and printers as well as media products.

The company claims to be the leading independent maker of disk drives. Despite declining earnings in 1979, Memorex increased its research and development expenditures 20% last year.

### Thin-Film Technology

Memorex's Recording Technology Center has been focusing on thin film heads and media, the technology IBM announced with its 3380 disk products.

For its plug-compatible disk product line, Memorex, like other major competitors, has offered enhanced drives rather than copying IBM. The company has incorporated a dual porting feature into its double-density 3350-type device.

The company's intention is to ship more and more double-density 3350-type units, which will be more cost-competitive with IBM, Gary Land, vice-president of product management for the Storage Systems Group, said.

However, industry observers point to Memorex's increased emphasis on OEM sales. The firm reportedly recently concluded a two-year $60 million deal with Digital Equipment Corp. and another multimillion-dollar agreement with NBI, Inc. of Boulder, Colo.

Memorex's staunch competitor, Storage Technology Corp., has also been increasingly eying the OEM marketplace. OEM sales are a way of beefing up profitability, which at Memorex last year declined 26% from 1978. Moreover, the company said it will post a loss this year.

The company's problems appear to be in equipment sales.

# • STC Holds Lion's Share •

LOUISVILLE, Colo. — Concentrating almost exclusively on mass storage devices, Storage Technology Corp. (STC) holds the largest share of both the IBM-compatible tape and disk markets.

Of the estimated 30,000 IBM-compatible tape units installed, STC accounts for about 25,000 or 83.3%, according to Peter Wright, director of portfolio programs for the Gartner Group.

In the plug-compatible disk market, STC last year had $123.9 million or 34.8% of shipments, James M. Porter, publisher of the annual "Disk Trend Report," calculated.

In its formative years in the early 1970s, STC concentrated on high-performance tape products, closing in on a niche IBM neglected because it bet disk storage would replace the need for tape. Today STC's tape products account for nearly 70% of earnings, STC Chairman and President Jesse I. Aweida, estimated.

STC did not deliver its first disk products until 1975, Datapro Research Corp. noted. Currently 90% of the firm's revenue is estimated to be derived from storage products.

While analysts predict IBM's introduction of its 3380 disk drive is likely to mark a dry season for plug-compatible manufacturers (PCM), Porter thinks STC will do well because the company has been quick to respond to competitive moves.

However, because of the volatility of the PCM market, STC has been moving into new markets during the past two years.

Two new areas are OEM minidisk products and communications products. During 1978, STC introduced its 2700 minidisk and its COM2 telephone multiplexer concentrator. At the firm's annual meeting in May, Aweida said STC's goal is to become a major supplier of telecommunications products.

Moreover, the firm is reportedly still attempting to acquire a CPU product line, despite the failure of its recent merger negotiations with Amdahl Corp.

With 1979 revenues of $479.4 million, STC's sales have averaged 50.2% and earnings have averaged 66% annual growth during the past five years.

| | | | | | |
|---|---|---|---|---|---|
| | $1.48 | $1.38 | $1.13 | $.70 | $.71 |
| | $1.87-$2.39 | $1.55 | $1.40 (estimated) | $1.00 | $.86-$1.25 |

* Prices provided by vendors for two-year lease

CW Chart

# • CDC Snares • 14% of 3350s

MINNEAPOLIS — Although its plug-compatible disk business is a very small portion of the corporation's total revenues, Control Data Corp. has managed within the past two years to snare about 14% of the IBM 3350-type disk installations in the U.S., one analyst noted.

Expected to produce $1 billion in revenues during fiscal 1980, CDC's peripherals business, advancing at 33% annually, is the fastest growing revenue producer within the company's diverse product line.

Of this revenue, IBM plug-compatible products, including Omega mainframes, account for about 15% of the peripherals business. Last year CDC's plug-compatible disk sales were estimated at $78 million by James M. Porter, publisher of "Disk Trend Report."

Disk products represent between one-half and two-thirds of CDC's total peripheral sales, according to Thomas G. Kamp, president of peripheral products [CW July 2, 1979].

Making the move into IBM-compatible peripheral products was a natural adjunct to products being developed for OEMs and the firm's own systems, Ray Gleason, manager of marketing requirements, noted. "We have a large business, and R&D is applicable to many product lines."

The company is also involved in a joint venture with Honeywell, Inc., Magnetic Peripherals, Inc., for the development and manufacture of disk products.

While CDC intends to pursue the IBM-compatible market, in general that sector of the business takes a back seat to CDC's traditional mainframe and peripherals business. The company's total sales force for plug-compatible products numbers about 150 people, Gleason said.

With computer revenue of $2.3 billion last year, CDC has three major business segments: high-end processors for scientific and engineering segments; peripherals, 60% of which are sold on an OEM basis; and services, which last year produced revenues of $350 million. The firm also operates a finance organization, Commercial Credit, which brought CDC's total revenue last year to $3.3 billion.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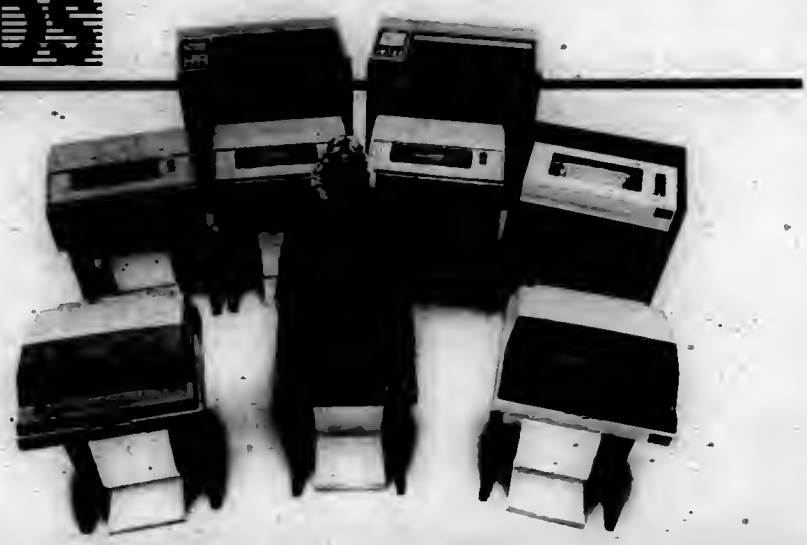

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# PCMs More Successful With Tape Than Disk

By Marcia Blumenthal
CW Staff

Perhaps because it has been a relatively stable market, plug-compatible tape drive vendors have been more successful snaring from IBM a greater share of the high-end 3420 market than they have for disk products.

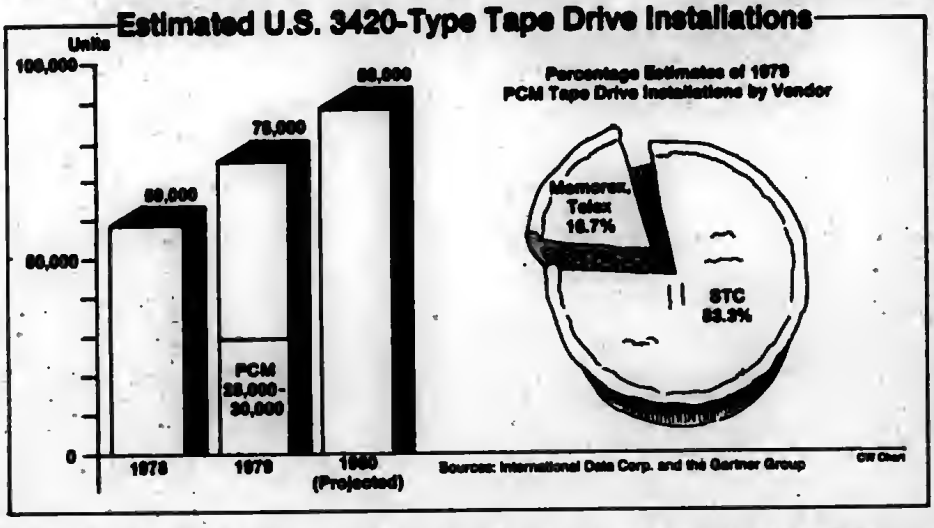
But IBM is expected to announce a new family of tape drive products, code-named Ocotillo, by the end of the year. These new products could offer a 10-to-1 advance in bits per square inch, according to Raymond C. Freeman, an expert in the tape market and head of Freeman Associates. The announcement is likely to leave plug-compatible tape vendors rushing to play catch-up, he observed.

The present IBM 3420 tape drives have been available for seven to 10 years. Other than the 8809, which was introduced in 1978 for use with the 8100, IBM has not announced any new products or significant changes in its six-model tape drive family. The 8809, which can also operate with the 4300 series, is also a streaming device, used for backup storage for Winchester disk files.

About 75,000 of the 3420-type tape drives are installed in the U.S. today, according to estimates by International Data Corp. Plug-compatible manufacturers (PCM) hold an estimated 40% share of those installations, market researchers said. In the higher end 6,250 bit/in. arena, PCMs could hold a 50% share, Freeman maintained.

By far the largest chunk — about 85% — of the IBM 3420-type market belongs to Storage Technology Corp. (STC). While IBM was banking that random-access memory disk would replace tape as the primary mode of mass storage, STC rightly bet tape storage would be around indefinitely.

Currently nearly 70% of STC's earnings are derived from large-end tape systems. And the profits from that line have been used to finance the firm's plug-compatible disk line.




### Memorex, Telex

While STC claims the lion's share of the market, Memorex Corp. and Telex Corp. are also factors in the marketplace.

Memorex, which entered the tape market in 1977, does not manufacture its 322X line, but rather buys from the Japanese computer giant Fujitsu Ltd. Memorex is estimated to hold 2% of the 3420 market, with 1,200 to 1,500 units installed, according to industry analysts. Telex, which was an early entrant in the 3420 market, is estimated to have about 4,000 to 5,000 units installed.

Although these three vendors have virtually cornered the market, Braegen Corp., which acquired California Computer Products, Inc.'s plug-compatible tape and disk line last year, offers refurbished 3420 Models 5 and 7, according to Dan Jakle, national sales manager of the plug-compatible line.

And, National Advanced Systems Corp. (NASC), which acquired Itel Corp.'s computer business last year, recently struck a deal with Hitachi Ltd. to distribute plug-compatible tape drives.

Although IBM has not ruffled the market with significant new tape offerings, industry observers note a new drive is in the wind. On July 28, IBM put all models of its 3420 line on limited new production. However, one source noted IBM will probably continue to manufacture new 3420s in France.

Whenever the new drive is introduced, it is expected to demonstrate significant advances in technology, leaving PCMs to either scramble to match the product or to decide not to make a comparable offering, tape expert Freeman speculated. He said the drive could have up to 18 tracks instead of the current nine and record up to 30,000 bit/in.

"It will probably not be general-purpose tape drive replacement for the 3420," Memorex's Gary Land, vice-president of product marketing, theorized. Rather, the new drive will be for a specialized purpose, most likely as a backup device, he noted, adding the new product will set the technology standard for a future 3420 replacement from IBM.

## • Others 'On the Fringe' •

Although Memorex Corp., Storage Technology Corp. (STC), Telex Corp. and Control Data Corp. dominate the IBM plug-compatible tape and disk market, several other vendors are poised on the fringe of that marketplace.

Until last year, the primary product line of the Braegen Corp., headquartered in Cupertino, Calif., was intelligent terminal systems compatible with the IBM 3270. Last October, however, the firm acquired the plug-compatible disk and tape products, sales and service organization and installed base of the financially beleagured California Computer Products, Inc.

Prior to that acquisition, Braegen had only eight service and eight sales personnel. Making the acquisition primarily to beef up its sales and service organization, Braegen now has 250 service and 40 sales people nationwide, according to Dan Jakle, national sales manager of plug-compatible products.

With the acquisition of Calcomp, the company has increased its customer base significantly, adding 700 disk and tape customers, Jakle noted. This gives Braegen the opportunity not only to market its terminal products but to offer tape and disk upgrades to its customers.

Although a sales and service organization appears to be a prime requisite for competition in the end-user-oriented plug-compatible tape and disk market, Information Storage Systems (ISS), a division of Univac since 1973, always sold its plug-compatible tape and disk products on an OEM basis. Its primary disk customers were Itel Corp., STC and Telex, which in recent years have ceased purchasing from ISS. Today only Telex purchases disks from ISS.

Always the subject of speculation, Japanese makers Fujitsu Ltd., Hitachi Ltd. and Nippon Peripherals Ltd. would welcome a more active role in the U.S. market, analysts note. However, none of these firms have the necessary sales and service organization for heavy end-user sales.

Presently Hitachi and Fujitsu have U.S. outlets through Memorex Corp., National Advanced Systems Corp. and Amdahl Corp. for their products. This activity has the potential of nibbling business away from established vendors in the marketplace.

In addition, the recently established TRW Fujitsu Co. could provide the Japanese maker the direct sales and service organization for plug-compatible peripheral systems, observers note.

Finally, Intel Corp. made a splash into the IBM-compatible disk arena last year with its Fast 3805, a solid-state disk. Intel is expected to introduce a fixed-block architecture version of this product later this year, a source noted. Whatever the firm's intention, Intel will remain in a very specialized area of the marketplace, according to Stephen G. Maysonave, director of sales for Intel's Commercial Systems Division.

## • Telex a Survivor •

TULSA, Okla. — A survivor of a bitter antitrust suit with IBM that ended in 1975, Telex Corp. consists of two separate companies, Telex Computer Products, Inc. (TCP) and Telex Communications, Inc.

Once a participant in the plug-compatible disk market, today TCP's storage products are primarily tape, both IBM plug-compatible and OEM. The firm also makes terminals, printers and data entry equipment.

Tape represents more than 50% of the revenues of TCP's Peripherals Division, according to Bert Hochfeld, director of product planning and strategies. Currently the company has a total of 12,000 tape units installed, he said. Some 4,700 to 4,900 are estimated by analysts to be plug-compatible units.

Although plug-compatible manufacturers have seen the most growth in the high-end tapes, Telex until recently only had one IBM 3420-type product that recorded at 6,250 bit/in. — Telex 6420-66.

Last year, however, the company introduced its Series 80. Compatible with the 3420, the Telex units are one-third the size of conventional 3420s, have a patented tape path, generate less heat and use less power than their IBM counterparts and also record at 6,250 bit/in.

The Series 80 is an offshoot of a tape system built for the mini marketplace.

## *But None for Courageous*

# Micros Join Two Crews in America's Cup Trials

By Tim Scannell
CW Staff

NEWPORT, R.I. — When three U.S. sailing crews tackle wind and wave this week to decide who will defend this country in next month's America's Cup races, the competition will involve more than seamanship or the cut of one's sails.

Two of the American yacht entries — Clipper and Freedom — will be aided by onboard computers that have been gathering stress and weather data since the beginning of the America's Cup trials last month. Clipper has a Data General Corp. MP/100 microcomputer and Freedom is using a Hewlett-Packard Co. 9825, both installed in each boat's navigator's station.

In addition to its micro crew member, the Clipper team has an onshore DG 4/X minicomputer at its dockside office that is used to analyze statistical data as it is transmitted by the shipboard system.

However, the third American entry, Courageous, will adhere to the traditional seat-of-the-pants philosophy of sailing and go down to the sea without a computer. Although a Digital Equipment Corp. LSI-11 was used onboard the Courageous in 1974 and 1977, when both times it captured the America's Cup prize, the microcomputer will not be used at sea this year.

According to reports, Courageous' captain, Ted Turner, ordered the machine turned off and removed from his yacht. The dejected computer was last seen at the courageous waterfront office, reportedly being used for basic weather analysis.

### Not Taking Chances

"Sailors don't understand [computers] too much, but they seem to think its OK," Richard McCurdy, an engineer and designer of Clipper's computer system, stated. Most entries in the race have some sort of computer onboard because "they don't want to take the chance that the computer is not useful."

The MP/100 onboard Clipper is a 64K-byte machine with two teletypewriter interfaces and two I/O ports. Among the people who helped McCurdy install and program the system were Tom Johnson, a systems engineer on loan from DG, and Dave Pedrick, a yacht designer.

"We must have used up a couple of man-centuries of volunteer labor getting [the system] on there, McCurdy quipped.

The computer weighs about 20 pounds and is connected through a maze of waterproofed wires to virtually every instrument and point on the boat. Basically, the computer monitors boat speed, apparent wind angle (the actual wind angle plus the effect of the boat's motion), wind speed, heel angle, the direction the boat is sailing, rudder position, trim tab position, water angle, pitch and time, McCurdy said.

The microcomputer can also handle information input by the yacht's navigator concerning tides and positions of the racing marks, he added.

Data collected by the computer is recorded on tape and also transmitted back to the 4/X minicomputer at a rate of twice a second. The landlubbing mini processes and analyzes the transmitted data — which amounts to about a million pieces of statistical information per day — and has performance results ready when the Clipper crew docks at the end of a sail.

"We build up a file on disk from the [Clipper's] telemetry and on a long day we end up with something like 2.5M bytes of data," McCurdy claimed, describing that amount as "serious work."

As an added option, the MP/100 is also outfitted with a speech synthesizer that allows the computer to "talk" to the navigator during a race, supplying such information as the time to the start of the race and boat speed.

"This type of information is invaluable during those times when the crew is too involved in the race to be able to look at the display screen," McCurdy noted.

### Freedom's System

By comparison, the HP 9825 onboard the Freedom is a lot less sophisticated than its Clipper counterpart. Like Clipper's system, the HP desktop is linked to all of the 12-meter yacht's instrumentation. However, information is output via a single-line display and is not retained or analyzed, an HP spokesman said.

Although computers are fast becoming accepted in the worldwide yacht-racing scene, convincing dyed-in-the-wool sailors to use them is "a long battle" because they "change the reference that sailors use to sail boats," McCurdy observed.

"The computer is not there to tell them how to sail the boat; its there to provide hard numbers about what's happening."

For instance, when Clipper moves through the water it is propelled by a combination of the actual wind and the wind created by the movement of the boat, McCurdy said. "Knowing where the wind is coming from and how hard it's blowing is difficult unless you sort of take the boat speed out of the wind so that you can see the wind as through you weren't moving."

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# User Attitudes: What

## SALARIES OUT OF LINE

most feel pay rises will be less than 10%

• *Do you expect the average salary of computer staff in your company over the next 12 months to rise? stay the same? fall?*

Nearly half the installations participating in the survey expected to pay salary increases that will fail to keep pace with inflation. "We'll be paying around 10%, which is in no way in line with the consumer price index. The index is running at about 15% at the moment," one MIS manager said.

Most of those interviewed believe DP salaries are too high. "We have to pay engineering-type salaries just to be competitive. These guys reach a level and then they become mundane. They don't merit it, they don't need it, but others pay it and it becomes a matter of ego. We have to pay, but we're out of step, higher than the rest of the company," one said.

Those expecting to pay smaller increases will do so because of special circumstances. "Our location means we don't have to pay too high," one manager explained. "We can pick them up OK without offering the earth," another said. "They come from Los Angeles to get away from the commute and the pressure."

The amount of pay rise expected was higher in the larger companies.

| company size employees | 1-99 | 100-999 | 1,000-9,999 | 10,000+ |
|---|---|---|---|---|
| those expecting to pay more than 9% increase | 57% | 42% | 50% | 76% |

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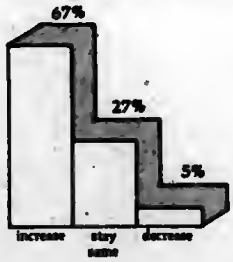



software budget goes up

• *Do you expect the amount spent by your company on proprietary and vendor software over the next 12 months to increase? stay about the same? decrease?*

Because of the difficulty putting together development staffs, many installations said, they are turning to packages. "The people shortfall is so great that we just had to find another way," one user explained.

Attitudes are changing. Another user said, "There used to be a time when we wouldn't consider buying packages. People would say, 'Can't you write your own?' But now renting or leasing software has become respectable.

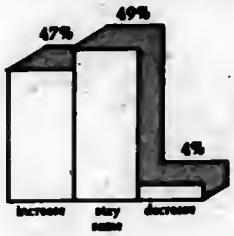
"Today's well-paid man is smarter — but he's narrower. He's not the generalist we used to have. He just can't cope," the user added.

Better control was given as another reason for buying ready-made programs: "I get the certainty it will work, even though it's not the best. And if it doesn't work, I've got an out," one DP manager admitted.

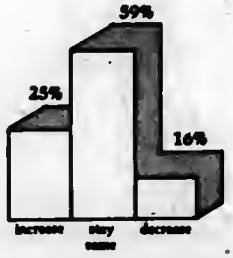
Maintenance was also mentioned: "It's not that we couldn't do it ourselves, but the outside supplier is committed to maintaining the packages and making them better. This way your applications grow. But your own staff — they move on and their programs stagnate."

Many users, however, complained about pricing policies. "The large equipment users are being killed," one DP manager lamented. "The magic number for any mainframe package is $35,000 — plus $5,000 to maintain. I can get the same thing for $600 a month for the System/34."

## STAFFING HOPES UNREALISTIC




installations believe they can expand their development teams . . .




. . . and their operating staffs

• *Do you expect the number of systems and programming staff employed by your company over the next 12 months to increase? stay about the same? decrease?*

• *Do you expect the number of operating, data entry and control staff employed by your company over the next 12 months to increase? stay about the same? decrease?*

Although the national shortage of programmers and analysts is numbered at more than 100,000, 47% of the installations surveyed expect to increase the size of their development staffs. Where will this staff come from?

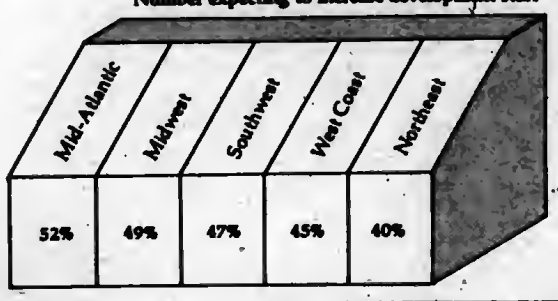
It appears that most of these users' plans will be frustrated, with the more determined companies succeeding at the expense of others: "We use every vehicle we can find: contingency search, retainer search with body snatch money paid up front, we place ads, we even pay internal bounties — good people usually know other good people, and for a bonus they'll tell you where to find them."

DP managers often conveyed a feeling of desperation during interviews; they cannot take advantage of hardware improvements because of staff shortages. "We've had a hundredfold increase in hardware capacity but only a 5% increase in output. The users are held back because we can't deliver. There's a three-year backlog of demand here," one told us.

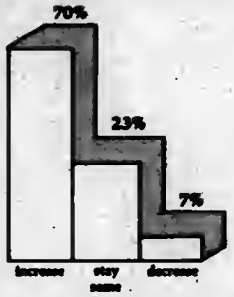
Attempts to increase supply were mentioned — "We turned to 'fresh outs'" — and to improved job satisfaction — "They're bright but bored, so we changed from pure programming to analyst/programmers."

As the figure below shows, the Mid-Atlantic users have the most ambitious expansion plans.

Number expecting to increase development staff



## HARDWARE BOOM DEFIES RECESSION




70% plan to spend more

• *Do you expect the amount spent by your company on hardware over the next 12 months to increase? stay the same? decrease?*

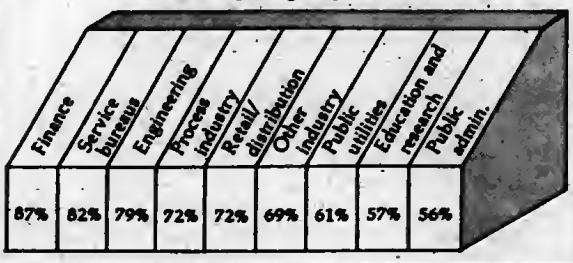
Despite general cutbacks, there is no sign that computer budgets will be affected. The Urwick hardware indicator shows that a massive 70% of those surveyed intend to increase their expenditures during the next 12 months.

Interviews showed that demand was user-led, with cost frequently no object. "We used to cost-justify," one DP manager said, "but not now. It's distributed processing. Everyone wants to push a button. I'm not in favor, but I'm not going to thwart them."

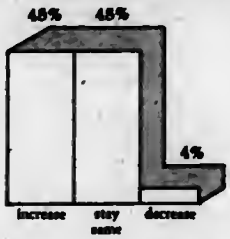
Others felt the computer is now perceived as a genuine aid to cost-cutting: "Data processing is mature now. We've convinced management we can help both expand and contract the business, so the work load never drops off. We used to anticipate a two-year life cycle, but we're upgrading much faster now. The users can fill every disk we install."

The financial sector has the most ambitious expansion plans, with public administration at the bottom of the league.

Number expecting to spend more on hardware




## DECENTRALIZATION MOVES AHEAD




nearly half give users more power

• *Do you expect the amount spent by your company on user-controlled hardware, software and DP staff over the next 12 months to increase? stay about the same? decrease?*

Nearly half the installations polled plan to increase user-controlled data processing during the next 12 months. "It makes psychological sense," one manager said. "We're putting the machines where the people are. Hardware's going to be distributed dramatically."

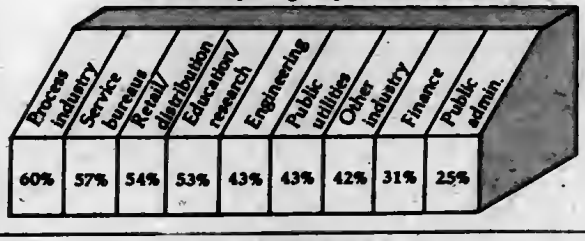
One of the reasons given for decentralization was user education. "There are awakenings," another manager said. "The users begin to realize the reasons for delays."

But decentralization should not go too far, the managers warned. "We have to achieve integrated systems someday," one explained. "Give it to all the users and you're never going to wire all these things together."

Minicomputer vendors came in for criticism. " 'Why use these central mainframe boys?' the salesmen ask us. 'They give you lousy service.' The mini vendors don't tell all the problems; expectations get raised to an unreasonable level."

The process industry has the biggest plans for decentralization.

Number expecting to spend more on hardware

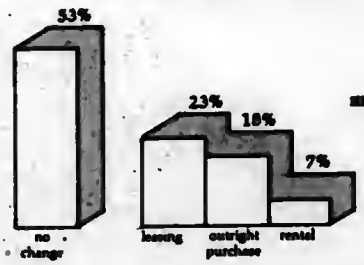



*More Survey Data on Page 12*

# User Attitudes

(Continued from Page 11)

## BIG SHIFT TO LEASING




• *Do you expect the method of financing your hardware over the next 12 months to shift toward rental? outright purchase? leasing? Stay the same?*

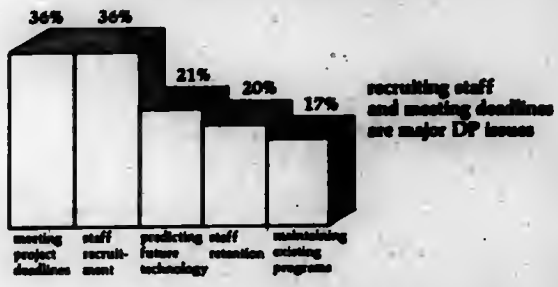
Some change in their method of financing equipment was planned by nearly half of those responding to the survey. Most expect to move toward leasing.

Uncertainty concerning future technology was given as the main reason: "We all got burned with IBM's recent announcements. The market values just dropped off, so I'm going to leave the risks in the hands of the lessors — let them get burnt."

Interest rates were considered attractive when considered against a background of rapid obsolescence. "There's been no surge in interest rates, but the manufacturers are obsoleting equipment on a chronological basis by raising the cost of maintenance," one DP manager said.

While 38% of those polled prefer some form of delayed payment, 18% expect to pay cash. Those most in favor of moving to outright purchase were service bureaus (23%), public utilities (21%) and education (21%).

## STAFF SHORTAGES CAUSING PROJECT SLIPPAGE




• *What is the major issue facing you at present — staff recruitment? staff retention? "go-it-alone" users? meeting project deadlines? meeting project cost targets? maintaining existing programs? evaluating present technology? predicting future technology?*

The difficulty of completing development projects on time was the major issue faced by 36% of installations. "The truth is that I'm a lousy manager," one refreshingly frank MIS chief said, "but who ever met a DPer who could tell the truth? People don't want to hear it.

"You know at the start you're never going to make it. It's the maintenance problem. We massage lots of little systems and fight fires and the development suffers. If they would listen, I'd tell them!"

Staff recruitment equalled project deadlines as a major issue; predicting future technology was also mentioned frequently. "We're going to run out of CPU soon. I'd like to order another machine, but I don't know what to do. Whatever we do in DP is long-term, but the equipment doesn't last that long anymore. The problem is, what's IBM going to dead-end? A DP manager has to be lucky," one manager declared.

The issues facing DP managers is analyzed in more detail in "The Urwick Report," an in-depth study of 12 U.S. companies. It is available for 29.95 — less a 15% discount to CW readers — from Shirley V. Pratt, U.S. Representative, Urwick International Ltd., Suite 6R, 305 West End Ave., New York, N.Y. 10023.

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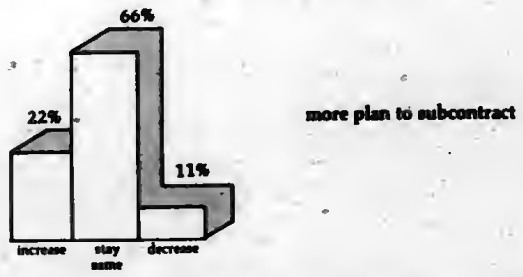
## CONTRACT PROGRAMMING LOOKS GOOD




• *Do you expect the amount spent by your company on outside DP staff over the next 12 months to increase? stay about the same? decrease?*

Although DP managers are planning an increase in the use of contract programmers to combat staff shortages, they expressed mixed feelings about this source of programmers.

"You get all sorts," one explained, "but I like them. They give me value for the dollar — or I get rid of them."

Others, however, were not so convinced they get their dollar's worth. "We're trying to get out of the contract business. At $45 an hour, it's got to be a short-term solution compared with $20 to $25 an hour if you do it yourself," one of those surveyed said.

On balance, the pressure of filling staff positions seems to be overriding any objections to contract programming. "I'll take anyone I can get," one manager summed up.

Engineering (36%) and public administration (31%) plan to make the most use of contract programmers.

*For PDP-11, VAX-11/780*

# DEC Adds 300M-Byte Drive, Cartridge System

MAYNARD, Mass. — Digital Equipment Corp. has introduced a high-capacity hard disk drive and an entry-level cartridge tape system, both designed for its PDP-11 and VAX-11/780 minicomputers.

The RM05 disk drive has a 300M-byte storage capacity, a 45% increase over the firm's previous top-of-the-line RP06 model. The drive is available either as a subsystem, consisting of the disk drive and a controller, or as an add-on unit. The unit is compatible with existing Massbus disks, enabling direct add-on to DEC systems, a spokesman stated.

The free-standing RM05 has an access time of 38.3 msec and a peak transfer rate of 1.2M byte/sec. The device employs a 12-in. disk pack with 19 read/write surfaces and one read-only servo surface. It also has a recording density of 384 track/in. Up to eight 300M-byte disk drives can be connected to one controller, the spokesman added.

The TU58 cartridge tape system utilizes DEC's previously introduced TU58 Dectape II cartridge drive and is available as a rack-mountable or table-top device. The unit has a 250K-byte capacity per cartridge, or a 500K-byte capacity per system.

The TU58 has an adjustable data transfer rate, via jumper selection, from 150- to 34,800 bit/sec. The unit's high-speed search mode provides a 9-sec average access time and a 30-sec maximum access time.

In addition, the cartridge tape system has a built-in microprocessor to perform tape housekeeping chores and handle communications protocols. The drive is supported by the RT-11, RSX-11M, RSX-11M-Plus, RSTS/E and VAX/VMS operating systems.

The 300M-byte drive costs $44,000 with a controller, or $34,000 as a system add-on. The TU58 system lists from $1,750.

DEC is located at 146 Main St., Maynard, Mass. 01754.

## Managers on the Move

JOHN CRAWFORD has been elected assistant vice-president of the Hartford Insurance Group. He is responsible for claim services, financial services, life systems and corporate services.

Formerly vice-president of data processing and administrative services at Horace Mann Insurance Companies in Springfield, Ill., Crawford joined the Hartford earlier this year as deputy director of data processing. He was previously a senior consultant with Arthur Andersen Co. in Philadelphia.

John Crawford

Crawford is a 1966 graduate of Temple University with a B.S. in accounting.

•••

DONALD H. NEVINS has been promoted to vice-president for insurance systems and services for Mutual of New York (MONY) in New York City.

Nevins will continue to be responsible for the company's policy-owner service functions. In addition, he will chair a committee charged with studying how MONY can most effectively utilize new technology for the accumulation and distribution of information.

Nevins joined MONY's management program in 1958 and has received several promotions up to his most recent appointment.

Nevins is a graduate of Trinity College.

•••

MAX D. HOPPER has been elected vice-president of data processing and communication services at American Airlines' Dallas/Fort Worth, Texas, headquarters.

Hopper will be in charge of data processing activities in Dallas/Fort Worth, as well as systems development and computer operations and technical support functions located in Tulsa, Okla.

Hopper, who joined American in Tulsa in 1972 as director of American's reservations computer system known as Sabre, had been assistant vice-president of marketing automation programs.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*More Harm Than Help?*

# Managers Warned of Contract Programmers

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — Information system managers should exercise extreme caution if they are thinking of hiring self-employed contract programmers to supplement or replace members of their full-time computing staff.

Although some contract programmers apply themselves assiduously and maintain extremely high professional standards, many others are no more productive or conscientious than their average non-free-lance counterparts. Some contract programmers, in fact, work for themselves not by choice, but out of necessity, according to Al Strong, president of a local contract services firm specializing in securing jobs for management information systems (MIS) personnel.

A few contract programmers can even be classified as occupational misfits who turn in the end to free-lancing because they can't find steady work in any other way, according to Strong, head of Contract Personnel Services, Inc.

Even though self-employed programmers undeniably fill an important business need and often serve their temporary employers admirably, MIS managers would probably be well advised to avoid using free-lancers unnecessarily, Strong warned.

### Sense of Loyalty

Unlike programmers who work permanently for one company, most self-employed free-lancers seldom develop a strong sense of loyalty for the users to whom they sell their services.

As a general rule, contract programmers are constantly hopping from job to job, rarely working for more than a few months at a time for any one client. As a result, at times the temptation for contract programmers to cut corners on a project becomes difficult if not impossible to resist, Strong said.

Free-lancers realize their responsibility to a given client ends as soon as their contract with that employer expires. They also realize that if their work contains some imperfection they will probably be long gone from a customer's site by the time the trouble is detected.

One criticism directed most often at self-employed programmers is they sometimes complete their development work and move on to the next job before they have done any of the necessary documentation, Strong said. Later, when the omission is finally discovered, the unfortunate client usually has no alternative but to assign the onerous task of documentation to a member of his full-time staff.

Another alleged drawback of using self-employed programmers is that they are usually unacquainted with the nuances of their employers' work procedures and have to undergo a certain amount of orientation before they can operate st their peak efficiency, Strong said. Self-employed programmers have also been known to stir up staff resentments and even contribute to a clients' personnel turnover by bragging aloud about their salaries, which often run significantly higher than those of their staff counterparts.

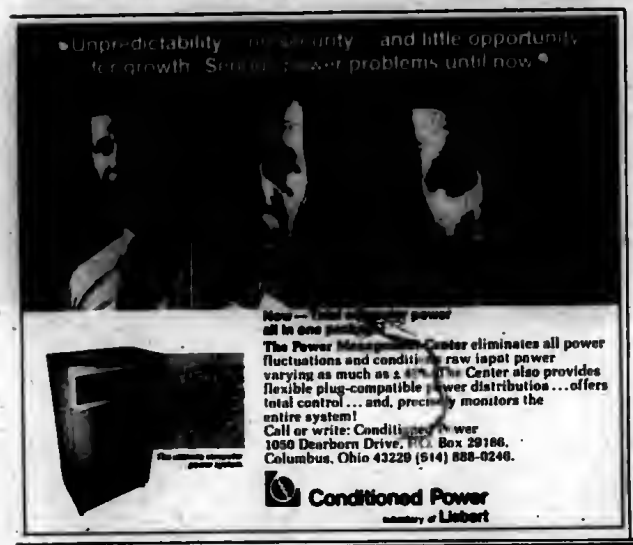
To make matters worse, a self-employed contract programmer's job qualifications snd professional competence standards are frequently impossible for a prospective employer to evaluate reliably. The main reason for the difficulty, Strong explained, is that many users keep employment records only for the people they employ permanently — not for individuals they hire strictly by contract.

For some users of self-employed contract programmers, the task of trying to winnow qualified job applicants from the incompetent is somewhat like struggling to find a lost object in the dark.

In short, users who want to avail themselves of a self-employed contract programmer's services would probably do well to head the age-old adage "Caveat emptor" — let the buyer beware, Strong added.

Strong's opinion of contract programming and its alleged user drawbacks contrasts sharply with the views of another contract services company head, Stuart Magie.

Unlike Strong, Magie regards self-employed programmers as generally superior in professional competence and productivity to their non-free-lance counterparts [CW, July 14]. Magie, who serves as president of Real-Time Personnel, Inc. here, also advises users to dispense with full-time staff members, except for a small core of project leaders and other key senior personnel, and employ contract programmers instead.



# UK Execs Say Guides Needed On Personal Data

MANCHESTER, England — Unauthorized use of personal data stored in computers is getting out of hand and the only way to stop it is to enact some stiff regulations.

That is what 200 UK corporate and data processing executives believe, according to a recent survey by National Computing Center, Ltd. Ninety percent said some form of regulation of computer-stored information is needed. Seventy-five percent said there should be specific laws against unauthorized use of personal data, enforced by a government data protection authority. But if a government agency to guard against privacy violations is not proposed, most of those polled favored a voluntary code of ethics to be enforced by companies with computers, the firm said.

Establishing a clearer definition of personal data use was the main reason, for more regulation, according to those polled.

Despite the overwhelming support for some form of data regulation, only half of those polled said their firm had studied the impact of a government data proctection authority on business operations. Less than one-third reported taking steps of self-regulation, National Computing said from Oxford Road, Manchester, England M1 7ED.

"Your Suppose Your Modeling Group Could Write a Program to Simulate Some Work Back There?"

# House Hearings This Week on Revamping FAA

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Congress this week takes up several proposals to revamp the Federal Aviation Administration (FAA), after a year's hearings on air traffic control computer outages and assorted attacks on FAA efforts to enhance air traffic safety.

The House Aviation Subcommittee will receive testimony Wednesday and Thursday on three pieces of legislation that would restructure the FAA to ensure, the bills' sponsors said, that safety is the agency's foremost concern.

Numerous reports during the past year on air traffic control computer failures and related midair near-collisions have led to increased scrutiny and criticism of FAA administration and development of the nation's air traffic control system.

Although FAA officials have told Congress the U.S. has the best and most reliable system in the world and is following a well-charted course to upgrade system hardware and software, air traffic controllers and system maintainers have been very vocal in criticizing the system's reliability, or lack of it, and FAA administration in general.

### Proposed Bills

Legislation to be considered at this week's hearings include proposals to make the FAA more answerable to Congress, more independent of the aircraft and airline industries and more concerned with air safety in the U.S. in general.

The bills before the subcommittee are:

- H.R. 351, introduced last year by Rep. Barry Goldwater Jr. (R-Calif.), which would make the FAA an independent agency. The FAA presently is part of the Department of Transportation.
- H.R. 6771, put forward by Rep. Elliott Levitas (D-Ga.) this spring, to direct the FAA administrator to perform no "functions, powers and duties other than those pertaining to aviation safety."

Some critics of the FAA have complained the agency spends too much time "promoting" the aviation industry. Under the Levitas proposal, all agency activities not related to air traffic and airport safety would be handled by the Transportation Department, freeing the FAA to concentrate on safety matters.

- H.R. 7850, the "Air Safety Reorganization Act of 1980," introduced last month by Rep. Robert Matsui (D-Calif.), to divide the FAA into separate administrative and R&D agencies.

Matsui's bill would establish a new Air Safety Administration, reporting directly to Congress, to perform "the important regulatory and research activities" that Matsui says are "now buried within the FAA."

The day-to-day operation of the air traffic control system and administering the airways development fund would remain under the Transportation Department, Matsui proposed. There, an "Aviation Operations Administration" would also "develop and report to Congress on a comprehensive, long-term plan to improve the safety of aviation operations, with particular attention to the air traffic control system and collision avoidance."

In introducing the bill July 28, the California Democrat noted several recent reports criticizing FAA policies and practices and recent Congressional hearings on collision avoidance systems and computer breakdowns and outages "which endanger air traffic control operations.

"Because the FAA has no overall planning process, its actions in dealing with individual safety problems are perceived to be reactive rather than anticipatory," he said. "The agency has not adequately marshaled its forces to deal with safety problems quickly and effectively."

*Drawing Protest from Arinc*

# Bell Asks Hike in Private-Line Charges

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — A 600% increase in AT&T's charges for private-line service calls, scheduled to become effective early next October, evoked a protest early this month from one group of data communications users. Aeronautical Radio, Inc. (Arinc), which operates a large private-line network for most of the nation's airlines, asked the Federal Communications Commission (FCC) to suspend the increase and in the meantime investigate its legality.

Presently, when AT&T makes a private-line service call and the trouble is caused by customer-provided rather than phone company-provided facilities, the customer is charged $11.35. If the customer is later able to convince AT&T that the outage was due to its equipment, he is entitled to receive a credit for the time that service was interrupted.

In most cases, this "service interruption credit" now covers all or most of the bill for the service call, Arinc indicated. But next October, the charge will rise to $80 if the tariff now pending at the commission becomes effective. As a result, the customer will be reimbursed for only a small part of his service call outlay.

"AT&T's service quality has deteriorated markedly in the last few years," the organization pointed out. "More than 40% of Arinc's system failures [have been] due to the failure of AT&T facilities. In more than 30% of the cases, Arinc [has] had to identify the failure following AT&T's denial that a failure existed."

The organization is also unhappy about the phone company's limited liability for troubleshooting expenses the customer incurs when phone company-provided facilities fail.

Arinc pointed out that the customer, in order to determine that a particular outage was AT&T's responsibility, must frequently employ his own maintenance personnel or call in an outside consultant. Under a tariff amendment adopted earlier this year, the most the customer can collect for these additional expenses is an amount equal to the service interruption credit, and in most cases it is far less than the outlay.

"As a practical matter," Arinc added, "such claims are usually not asserted," since the customer must file a claim with the phone company, the filing and followup expense "is usually much greater" than the amount ultimately collected, the organization said.

# Proposed Bell Service Runs Voice, Data Simultaneously

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T proposed a private-line service early this month that permits a single circuit to broadcast data one-way at 300 bit/sec while simultaneously carrying two-way voice communications. The user who wishes to obtain equivalent service at present must lease two separate voicegrade circuits, the company said.

A tariff covering the simultaneous voice/data station service is now pending at the Federal Communications Commission (FCC) and will become effective Nov. 1 unless delayed or rejected by the commission.

Typically, the service will utilize a four-wire multipoint voice contention circuit (Type 3002) to interconnect a Dataspeed 40/2 terminal with one or more Model 43 receive-only teleprinters.

The tariff covers charges for two types of station unit arrangements — one attached to the Dataspeed terminal, the other to the teleprinter; they keep data and voice signals separate. The former arrangement costs $80/month, the latter $36/month.

In normal operation, a remote station having information for all outlying stations gives the message by voice to the master station. The master station operator then types the message on the Dataspeed 40/2 terminal and transmits it to all outlying locations. They receive a typed copy of the message on the Model 43 receive-only teleprinter.

AT&T indicated that the primary market for the service is users now employing alternate voice/data and voice contention circuits to interconnect an average of 60 locations per circuit.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# Resale/Sharing of Private Lines Sparks Feud

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — A disagreement over resale and sharing of international private-line circuits appeared to be developing into a major controversy as of last week.

One likely result is that foreign telecommunications carriers and postal, telephone and telegraph agencies (PTT) will become even more reluctant to lease circuits by the month and will accelerate their current efforts to sell transmission service priced according to volume-sensitive rates. For U.S. users who employ computerized terminals, that could be serious.

It would increase charges significantly for many of them. "Also, a good deal of the data traffic transmitted between the U.S. and other countries would be shifted to public data networks from the transparent private lines now used. The networks are less efficient for many data communications applications because their technical parameters (such as transmission speed, frame format and communications protocol) cannot be tailored to individual requirements.

The latest chapter in the resale and sharing hassle began last June, shortly after the Federal Communications Commission (FCC) proposed doing away with an existing rule that bars resale and sharing of international circuits.

### CCITT Protest

The commission's announcement evoked a strong protest from Leon Burtz, director of the Consultative Committee on International Telephone and Telegraph (CCITT), the international association of telecommunications administrations that adopts common technical and operational "recommendations."

One such recommendation bars resale and sharing of circuits. Burtz, in a letter to the U.S. State Department, accused the FCC, in effect, of favoring a policy which would violate the CCITT rule. Two key U.S. Congressmen — Harley Staggers (D-W. Va.), chairman of the House Commerce Committee, and Richardson Preyer (D-N.C.), who heads a commerce subcommittee that has been investigating international data flow restrictions — agreed with Burtz.

Preyer and Staggers both worried about the boomerang effect of the FCC inquiry. As Staggers stated: "One effect of misguided commission action in this area" would be to jeopardize the international private-line services now employed by U.S. telecommunications users. Without these services, "many have estimated that the costs [to] the users would increase anywhere from 500% to 1,000%," Staggers added.

### FCC Response

FCC Chairman Charles Ferris has responded to these protests. Basically, he told each critic that the commission has kept foreign carriers fully informed of its plans for the resale and shared use inquiry and has made no secret of its disagreement with the CCITT recommendation (formally known as recommendation D.1) which bars resale and sharing.

Furthermore, Ferris said CCITT recommendations are not binding on its members and the FCC, while "fully committed" to supporting the organization, has a higher obligation — to assure that U.S. telecommunications users receive the most cost-effective service.

As Ferris said in his letter to Staggers: "Support of the CCITT should not . . . preclude the United States or any other country from pursuing those policies which best serve its own interest."

Underneath this verbal battle are some other issues that have irritated relations between the FCC and foreign telecommunications administrations for years. As these parties see it, we adopt policies inimical to their interests, which they must then obey because of our economic, political and technological clout. For example, most PTTs prefer cables to satellites, partly because they manufacture the former while we are the major suppliers of the latter. But the U.S. has forced them to invest heavily in satellites.

A second problem arises from the success of U.S. computer services firms in penetrating overseas markets. To protect their domestic service bureaus, other countries have been trying for years to restrict competition from the "Yankees."

One way is to raise the price of international circuits by substituting volume-sensitive private-line tariffs for the traditional leased-line contract which allows the customer to tansmit as much data as he wants, up to the technical capacity of the circuit, for a flat monthly fee.

Another reason for introducing volume-sensitive rates is that it helps the PTTs preserve their existing base of directly served customers, and their existing revenues. If circuits are priced according to the volume of data sent, rather than at a flat monthly rate, the cost increases with the amount of traffic and the economic advantage of sharing the line is diminished.

If the FCC allows resale and sharing of international private-line circuits, however, it will pose a new threat to the international carriers in the U.S. as well as abroad, at least as they see it. Then all U.S. users who have to communicate abroad will be free to use circuits jointly. At the moment, the only users actively exploiting this opportunity are customers of U.S. computer services firms and companies in a few industries — such as banking and air transportation — who have formed sharing groups to lease-line jointly from the international carriers here and abroad.

Other international telecommunications users have not done so mainly because no vendor has offered to resell other types of international telecom services. But, as a result of the FCC's publicly stated support of resale and sharing, that situation has changed.

Within the past year, the commission has allowed two firms — Consortium Communications, Inc. (CCI) and International Relay, Inc. (IRI) — to offer cut-rate, store-and-forward international telex services between the U.S. and UK. (The CCI service also transmits to points beyond the UK.) Recently, another firm, Unitel Corp. headquartered in Ardmore, Pa., requested a similar authorization. Telex, it should be added, is the international carriers' main revenue producer.

Since half of each international circuit between the U.S. and another country is provided by a foreign telecommunications administration, it could frustrate the commission's proposed policy by refusing to interconnect with shared or resold services.

### ICA Comment

This prospect already has been alluded to by one of the participants in the FCC's resale and sharing inquiry — the International Communications Association (ICA) — which represents many of the largest U.S. companies that lease international circuits.

In a comment to the commission earlier this month, ICA said that while it "favors adoption of international telecommunications policies which encourage competition . . . and the free flow of information," implementation of the FCC's proposed policy change "may be accompanied by severe restrictions on the use of essential private-line services. Therefore, ICA believes it is premature for the commission to promulgate final rules without adequate consultation in appropriate international forums."

Other interested parties — including the Computer and Business Equipment Manufacturers Association (Cbema) and the Association of Data Processing Service Organizations, Inc. (Adapso) — will probably say more or less the same thing in their comments, which were due to be filed with the FCC shortly after this issue of *Computerworld* went to press.

Even if the commission takes this advice it still may be unable to prevent retaliation from abroad. Says one knowledgeable source: "This controversy has developed its own momentum. The PTTs know that by tightening the screws slightly on their existing private line services, they can make U.S. users of those services scream. It would be smart strategy for the PTTs to do that while the inquiry is under way, just to ensure that the commission gets the message."


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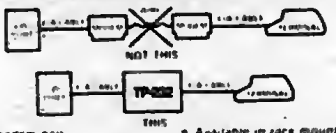


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*Citing Importance of Information Systems*

# IBM Asks Gas Ration Priority for Service Staff

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. – IBM wants priority status for computer system service technicians under any standby gasoline rationing plan that is approved, the firm has told the Department of Energy (DOE).

Commenting on the rationing proposal – which was recently approved by both the House of Representatives and the Senate [CW, Aug. 11] – IBM said the plan should take into consideration the importance of information systems not only to the general economy, but also to the administration of the rationing plan itself.

Because IBM's 35,000 service technicians operate their own automobiles rather than company fleet vehicles, under the plan they would not be eligible for the special "priority class activity" allotment of fuel during a gas shortage.

"Information-handling equipment and services are indispensable" for operations in "critical areas" identified by DOE in developing its rationing plan, IBM said.

"Emergency and other municipal services, defense and public transport systems are clearly dependent on those information-handling tasks; less obvious, but as dependent are energy production processes such as oil exploration, refineries and utilities."

Therefore, IBM said, "continual service to information-handling operations of such activities would be required because the equipment and services are interdependent and therefore inseparable.

"In other public and private sector activities," the company continued, "operations conceivably could be continued without information-handling products and services, but only at a significantly lower level of productivity.

"This would have a damaging impact on any economy and a particularly severe impact on an economy that would be weakened already by a shortage of fuels and by the constraints of rationing."

IBM said its 35,000 customer service employees drove an average of 7,000 miles each during 1979 in their work. The company said it would be willing to establish a logging and control system to show the historical use of these vehicles to help administer a supplemental gas allotment to those employees.

## Scanners Detect Lung Cancer

BALTIMORE – Doctors here at the Johns Hopkins University School of Medicine are using the computer technology employed in brain scans to diagnose lung cancer.

The system is the Pfizer computer-aided tumography (CAT) scanner.

The scanner develops a detailed image of the patient's chest cavity through a series of special X-rays that reproduce small slices of the patient's chest. Printouts of the slices can be used to determine whether small nodules on the patient's lungs are likely to be cancerous, according to Dr. Stanley S. Siegleman, director of the project.

If the test becomes a standard procedure, it will probably save thousands of unnecessary risky chest surgery operations, Siegleman said.

The test is based on identifying whether there is calcium in the nodule. If calcium is present, even in minute quantities too small to show up on conventional chest X-rays, the nodule is almost always benign, Siegleman said.


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## *Transition From Period of Invention*

# Consultant Sees Era of Implementation Ahead

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Just as the 1960s and 1970s were periods of rapid technological invention, the 1980s and 1990s will be periods of rapid technological implementation, a local business consultant predicted during a recent telephone interview.

The advent of the 1980s marks a turning point in the computing field's technological evolution, according to Joseph Fusco, head of Joseph Fusco & Co., a high-technology consulting firm.

During the previous two decades, the computing field devoted the bulk of its energies to laying the technological groundwork upon which all modern-day computer systems are, and will continue to be, built.

The last 20 years of the industry's history have been characterized by a rapid succession of technological breakthroughs in telecommunications, microelectronics and other basic hardware and software disciplines.

Now, with most of the necessary systems building blocks already firmly in place, the main focus of the computing field's technological interests is slowly beginning to shift. The industry's traditional emphasis on technological invention is gradually giving way to a growing concern for how those inventions are going to be applied, Fusco said.

Computing hardware and software will continue to progress, but most of the expected advances will result more from refinements and improvements to existing technology than from new technological breakthroughs, the consultant added.

### Impact of Transition

The computing field's gradual transition from invention-mindedness to application-mindedness will bring profound changes in the way Management Information Services (MIS) managers do their jobs.

First, the transition will force MIS managers and their departments to move increasingly into the mainstream of their companies' corporate activities. The computing field will slowly cast aside its traditional role as a mangement backwater and will grow in importance until it finally rivals the stature and influence of more established business disciplines like finance, marketing and corporate law, Fusco said.

"Computing systems managers of the future will have to understand a whole lot more than just how their departments can be used to solve a particular problem at hand," the business consultant added. "They will also have to have a solid understanding of where their departments' activities fit into the overall corporate scheme of things."

At the same time, MIS managers will also be called upon to help dispel the fear and mistrust with which computing systems and personnel are widely regarded by their nontechnical users. Ideally, Fusco said, computers should be as familiar and easy to use in a typical business office as typewriters, adding machines and photocopiers.

### Acute Need

The need for nontechnical users to feel comfortable with computers and understand their capabilities will prove particularly acute for high level executives.

"During the 1960s and 1970s, the typical non-computer-oriented business manager could depend for survival on sheer wile and guile, but during the 1980s and 1990s, wile and guile alone won't be nearly enough," Fusco warned. "Executives who know little or nothing about computers are rapidly becoming as obsolete as the whip-cracking Simon Legree type of manager."

Computer-literate or semi-literate corporate executives will enjoy a distinct competitive advantage over their nontechnical counterparts.

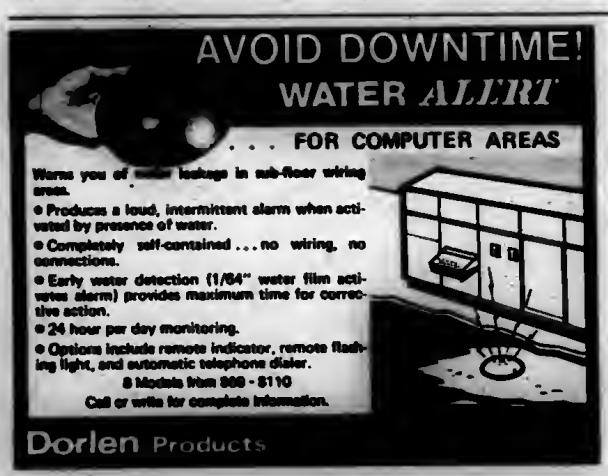
In the past, computing systems have been relatively limited in their business applications and have been used primarily as simple number-crunching tools by corporate accounting departments. Even today, the typical MIS system is limited in its application scope to a few selected management specialties, principally finance and manufacturing.

In the not-too-distant future, however, business computing will increasingly make its presence felt in other management disciplines as well, particularly marketing. Eventually, all the MIS systems for the various management disciplines will be integrated into a single, unified package capable of serving all facets of a company's business operations, Fusco said.

At that point, he added, the MIS field's transition from a specialized accounting tool to a general-purpose, business-management aid will be complete.

In particular, the development will pave the way for a bona fide business modeling capability that will allow top management to quickly tell how changes in crucial variables like overhead and production capacity will affect profit margins and overall company operations, Fusco said.

The availability of effective business modeling promises to relieve top executives of many of their trivial and time-consuming management details and increase the amount of attention such individuals can devote to more important duties like strategic planning and development of staff resources, he said.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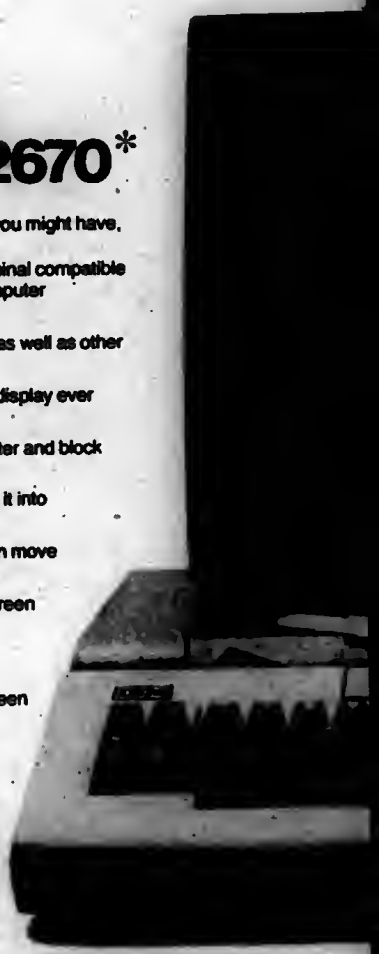

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# Los Angeles Pulls Through Three-Day Strike

By Connie Winkler
CW Staff

LOS ANGELES — Although data service bureau management maintained essential on-line operations during the recent three-day strike of 125 city DP employees here [CW, July 28], could they have done so indefinitely?

Yes, "we would do it — but it wouldn't be easy," said Wendell Meyer, general manager of the 350-person operation.

Anton Calleia, executive assistant to the mayor, acknowledged that the city has a contingency plan that includes running city work elsewhere, but he would not go into details. The 27 departments under City Council control "depend on the computer extensively," he added.

Meyer compared the contingency plan to a disaster plan, but would not specify how the city's data processing would operate if the two IBM 370/158 attached processors in the basement of city hall were not available.

At the fire department, firefighters would simply revert to manual or paper dispatching, according to Gerald Johnson, the department's community liaison officer. The department now uses a terminal network to dispatch equipment for its 3,500 emergency calls weekly, but the dispatcher can interrupt the computer recommendation and make his own dispatch.

### July Walkout

This operation was totally unaffected by the July walkout of 125 DP employees. The only effect of that work stoppage was an hour's delay in paycheck delivery and a delay in payment for a few rescue and ambulance personnel who had to wait until the next paycheck for overtime pay, Johnson said.

The Los Angeles Public Library is moving data entry personnel back under its own roof to decentralize its data processing work, said Mariana K. Reith, director of technical services there. The library was unaffected by the July work action because the most crucial work, the weekly book orders, was accomplished on the weekend.


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## Statements From 30 Organizations

# FCC Hears Further Comments on Inquiry II

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Another round of comments concerning the Federal Communications Commission's (FCC) "final" decision in the Second Computer Inquiry has arrived at the commission. Nearly 30 companies and organizations submitted statements to date. Most reported positions expressed earlier, but a few new thoughts were buried in all the verbiage.

These recent comments represent the latest step in a process that began last May, when the commission's decision was released [CW, May 12]. Comments on the decision from interested parties followed [CW, June 23].

Each participant replied to points made by the others in the preceding round. Now, the FCC must digest everything that has been said and decide what, if any changes, should be made in its "final" decision.

Possibly the most interesting idea came from the Computer and Business Equipment Manufacturers Association (Cbema). It recommended that the FCC institute a "further, separate proceeding" to determine how joint research and development activities should be structured.

In last May's decision, the commission concluded that AT&T as well as General Telephone and Electronics Corp. (GT&E) must establish separate subsidiaries to market terminals and "enhanced" — i.e., computer-based — on-line services. But the commission allowed each parent and its new subsidiary to develop terminal hardware jointly, while barring joint development of application programs and other software not "integral" to the terminal.

AT&T and GTE, as well as their competitors, objected to this arrangement. The carriers said it was too restrictive while the computer industry said it was not restrictive enough. In any event, Cbema said, today's application software is likely to be imbedded tomorrow in "integral" software, such as an operating system, or in hardware (e.g., a silicon chip).

In this way, the commission will be unable to accomplish its stated goal of encouraging the carriers to develop innovative services and systems while denying them opportunities to cross-subsidize these offerings surreptitiously with revenues derived from their "basic" monopoly telephone network services.

"It follows, therefore, that before permitting the parent and subsidiary to proceed in such joint efforts as R&D . . . the commission should institute a further, separate proceeding to establish the specific accounting, recordkeeping, and other conditions necessary to assure the absence of cross-subsidy," Cbema said.

Since the joint R&D scheme suggested by the FCC last May is opposed by AT&T and GTE, as well as by their competitors, there appears to be a good chance the commission will adopt this suggestion. However, judging from some of the other comments submitted to the FCC more recently, it will be difficult for such an inquiry to narrow the Grand Canyon-sized gulf that separates the carriers and the computer industry on the joint R&D question.

### Adapso Stance

According to the Association of Data Processing Service Organizations, Inc. (Adapso), the essence of AT&T's argument is that by prohibiting joint development of "nonintegral" software, "the commission will be depriving users of highly integrated hardware-software designs . . . [and] severely affect the ability of AT&T's affiliates to compete with others not so restricted. This is patently nonsense."

In its initial comment on the FCC decision last June, Adapso carried this thought further: Since the decision allows joint development of software "imbedded in or integral to [terminal] equipment," it permits AT&T or GTE to provide the "vast majority, if not all" of the software required by its enhanced services subsidiary, the association contended.

This "shortcoming" should be remedied by changing the decision to require that an enhanced services affiliate of either AT&T or GTE must perform all of its own software development, Adapso added.

This change "would only make it more difficult for the Bell System to produce offerings that satisfy user needs," AT&T said last week. The phone company then lashed out at the computer industry's main objection to joint R&D activity — the contention that such joint effort will lead to illegal cross-subsidization:

"The blithe assumption that basic service rates can be raised to provide a source for cross-subsidies ignores the fact that such Bell System . . . service already is subject to competition, and that competition of [this] traffic is increasing . . . dramatically.

"Local basic service also will be increasingly competitive . . . These factors provide substantial pressure against raising basic rates to support lower prices for enhanced services and [terminals]," Bell said.


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# Students Consult On Systems

MADISON, Wis. — While most universities teach computer science students to program computers, one instructor here is teaching students how to buy them.

Operating on the theory that buying a computer system can be a traumatic experience, professor Mohan R. Tanniru, with the University of Wisconsin, decided a year-and-a-half ago to give his students some practical experience and solve the needs of some small businesses at the same time. The students evaluate systems for real-life companies for a $20 fee.

So far, the students have evaluated systems for 28 small companies ranging from a bicycle shop to a neighborhood service group.

"Initially, I contacted businesses to arrange a project for a team of two or three students — majors in information systems analysis and design — to tackle a computer problem in the organizations. Now businesses have been coming to me, as they become more aware of what we have to offer," Tanniru said.

Student teams analyze the information requirements of the organization and suggest a system to meet the requirements, he explained. System designs could involve modification of manual methods, a partly automated system or full computerization.

The only demands on the company are a willingness to cooperate with the students, plus the $20 donation to cover student transportation and an end-of-semester party, he said.

"Benefits accrue both to the companies and the students. The companies get virtually free advice on how to adjust or adapt their systems to changing economic or business conditions, and the students obtain valuable experience by applying classroom analysis and design techniques to real-word problems."

Tanniru teaches at the university's School of Business.

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# Belgian Sentenced, Fined in Adabas Bribe Case

By Jake Kirchner
CW Washington Bureau

ALEXANDRIA, Va. — A Belgian citizen charged with trying to illegally obtain the Adabas data base management system source code has been sentenced to four months in jail and fined $500 by a federal judge here. He still faces possible fines from the U.S. Commerce Department.

Following his attorney's claim that Marc Andre DeGeyter is not a "Soviet agent" or "Belgian spy" as portrayed in U.S. and Belgian news accounts, the Brussels DP executive was ordered to immediately begin serving his sentence. He received credit for the five weeks he spent in custody following his arrest last May.

DeGeyter had already paid a $10,000 civil fine for violating the Export Administration Act under a plea-bargaining arrangement with federal prosecutors [CW, July 14]. Under the agreement, DeGeyter pleaded guilty to two misdemeanors for which he received the fine and jail term Aug. 1.

### 'Carried Away'

At the sentencing, DeGeyter's attorney, David Cutner, requested leniency for his client, arguing the Belgian is an honest businessman who got carried away by the prospect of obtaining the Adabas source code from its proprietor, Software AG of North America, Inc. [CW, June 16].

DeGeyter had been under Federal Bureau of Investigation surveillance for a full year prior to his indictment, Cutner told Federal Judge Albert Bryan. During that time DeGeyter's activities in the U.S. had been "perfectly respectable," though he "did step over the line with regard to the [Adabas] transaction," the attorney said.

DeGeyter, in a short statement before sentencing, told the court, "I feel very sorry and very guilty about what happened."

Bryan responded that he assumed the government had reduced the charges because it was unable to prove DeGeyter was a Soviet spy. However, he said, because DeGeyter had pleaded guilty to two misdemeanors, "some incarceration is warranted."

### Commerce Actions

In addition to the jail term and fine, the U.S. Commerce Department announced immediately following the sentencing it was initiating administrative proceedings against DeGeyter in connection with "further violations" of the Export Administration Act of 1979.

The compliance office of Commerce's Office of Export Administration informed DeGeyter it was investigating his activities relating to interstate and international travel to facilitate commercial bribery as alleged in two of the charges dropped by prosecutors during the plea bargaining.

DeGeyter could be fined $10,000 for each count of violating the export law and lose his U.S. export privileges. He has until the end of the month to respond to the new charges.

The new Commerce actions were "a complete surprise to us," according to Cutner. Reached last week at his New York law offices, Cutner said the action "violates the understanding we had with the U.S. Attorney's Office." That settlement already included payment of a $10,000 fine for violating the Export Administration Act, Cutner noted.

The attorney protested DeGeyter had already paid his fine and said the Commerce Department was trying to penalize DeGeyter for violations already disposed of in federal court.

### Soviet Transaction?

Cutner also vehemently denied that the plea bargaining included a DeGeyter agreement to cooperate with any government investigation of possible activities by the Belgian on behalf of the Soviet Union or any other illegal attempts to obtain U.S. technology.

When DeGeyter first approached Software AG about obtaining the Adabas source code, he said he represented Techmashimport, a Soviet trading company headquartered in Moscow, according to the indictment. Also, the U.S. Attorney's office here said that at the time of his arrest DeGeyter had documents indicating he might have attempted earlier to obtain an Intel Corp. semiconductor design for the Soviet firm.

Cutner said any speculation about cooperation between DeGeyter and the government in these matters is "total and complete nonsense" because there is nothing more for the government to investigate. DeGeyter was acting for himself at all times, even if he did hope eventually to sell the Adabas source code to the Soviet company or another company, Cutner said.

# Four-Day Info '80 Program Set

NEW YORK — Nine sessions on information management will be spotlighted in the four days of the Information Management Exposition and Conference: Info '80 at the New York Coliseum Oct. 6-9.

Thirteen other "conferences-within-a-conference" on specialized aspects will be featured. The keynote address for the sessions will be "Enterprise Systems: A Concept for the '80s," by Allen J. Krowe, IBM vice-president and president of the System Communications Division.

The session presentations will encompass information systems management, technology advances in DP, office automation and word processing and a short course will cover word processing/administrative support. A conference program listing speakers and their topics, exhibiting companies and other information can be obtained from show sponsor Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.


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The annual conferences of the Society for Management Information Systems are recognized as a unique opportunity to explore the critical issues in information resource management. For that reason, each year's list of speakers and participants includes the nation's leaders in the field.

This year, for example, major presentations will be made by Robert Price, Frederic Withington, Russell Ackoff, Gideon Gartner, Jay Galbraith, Ira Cotton, William Lape, to name a few. Through their contributions and others, the conference will examine the changing nature of management as a result of the convergence of technologies under the information resource/MIS umbrella.

The 1980 SMIS Conference is entitled "Putting It All Together: MIS Management in the Emerging Information Age." If you are an executive with an interest in probing the impacts that telecommunications, computers, office automation and related technologies are having on your profession and your organization, we invite you to join us. And, we suggest you bring your boss; this will insure that your organization receives maximum benefit from this important conference.

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## *Using 4331 Processor*

# COG Gets Local Government Forecasts Rolling

WASHINGTON, D.C. — Will Washington's Metrorail commuter system be running in the red in 1990?

That may not seem an important question right now to the thousands of commuters who only want to get to work on time, but it is crucial to the local governments in the Washington metropolitan area, and a computer is going to help them find the answer.

The study is one of many being done by the Metropolitan Washington Council of Governments (COG), which has a newly installed IBM 4331 processor.

For that study, the processor is being used to simulate a typical travel day. It will show what travel system — rail or bus — a commuter picks based on income, job location and so on. The 4331 will contain data showing the transit networks and population demographics.

Previously, COG prepared its forecasts using an in-house minicomputer linked to a data service bureau. Now it can run most of its programs on the 4331 from its downtown Washington offices.

COG is concerned with working toward solutions to area problems such as transportation, growth, housing, hospital care, air and noise pollution, water supply and quality, economic development and crime. It represents 16 local governments.

"With the 4331, we get more information and more timely information," Frank Leser, manager of COG's DP division, said. "It's a flexible tool that lets us get away from worrying about running the computer center. We use it as a hammer to construct options for local officials."

According to Leser, the 4331 increases staff productivity. "Before, we spent about 10% or 15% of our time tending the computer. With the 4331, we are down to 2% to 5%."

Installation of the 4331 is also a benefit for the local government because many have IBM computers and will be able to run COG-developed software on their own equipment. In addition, COG can use federal models developed for larger systems on the 4331, a savings since such models are expensive to develop.

Next year, COG will use the 4331 to put a "one-stop" census center into operation. COG will extract data about the Washington region from the 1980 census and make it available to the local governments, the public and business.

## Call for Papers

**NATIONAL MICROGRAPHICS ASSOCIATION (NMA) 35TH CONFERENCE AND EXPOSITION, Los Angeles Convention Center, April 27-May 1, 1981.**

The Conference theme is "Age of Productivity." The association is inviting professional papers for consideration as presentations. Topics include, but are not limited to, micrographic applications and technology as well as technologies that interface with, or relate to, micrographics.

Abstracts and outlines for presentations should be submitted to the Program Review Committee by Sept. 10. Abstracts should be double-spaced and at least 250 words in length.

All correspondence should be addressed to Al E. Eggert, Age of Productivity, Program Review Committee, NMA, 8716 Colesville Road, Silver Spring, Md. 20910. Further information is available from Sue Wolk, education coordinator at NMA.

**THIRD INTERNATIONAL CONFERENCE ON INTEGRATED OPTICS AND OPTICAL FIBER COMMUNICATION (IOOC '81), San Francisco, April 27-29, 1981.**

Papers are sought on the various aspects of fibers and cables; connectors, couplers, equipment, systems and transmission techniques; and integrated optics and active devices.

Two copies of both a 35-word abstract and a 200- to 500-word summary should be sent to IOOC '81, c/o Optical Society of America, 1816 Jefferson Place N.W., Washington, D.C. 20036.

**WORLD PRODUCTIVITY CONFERENCE, Detroit, May 17-20, 1981.**

The congress's theme is "Productivity — The Industrial Renaissance." Among the topics for which papers are sought are current concepts and implications of productivity performance at the micro, macro and international levels; effect and potential of technological developments; and technology transfer within and among nations.

Before Sept. 15, three copies of either a completed paper or an abstract (two-page minimum) should be sent to Conference Program Coordinator, American Institute of Industrial Engineers, World Productivity Conference, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

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# Calendar

Sept. 15-18, Portland, Ore. — **Structured Systems and Design.** Contact: Portland Associates, 4036 N.E. Sandy, Portland, Ore. 97212.

Sept. 17-19, Toronto — **Datamanager User Meeting,** sponsored by the North American Datamanager User Group. Contact: Pat Grant, MSP, Inc., 21 Worthen Road, Lexington, Mass. 02173.

Sept. 17-19, San Francisco — **Audit and Control of On-Line Systems.** Contact: the Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Sept. 17-19, Rio de Janeiro, Brazil — **Computer Networks.** Contact: Long & Associates, 820 Tioga Ave., Bethlehem, Pa. 18018.

Sept. 17-19, Vancouver, B.C. — **Digital Equipment Canadian User Meeting.** Contact: Digital Equipment of Canada, Ltd., Box 11500, Ottawa, Ontario, K2H 8K8.

Sept. 18, London — **APL-*Plus: Introductory Overview.** Contact: STSC, Inc., Seminar Program, 11 Clearbrook Road, Elmsford, New York 10523.

Sept. 21-23, Detroit — **National Bank Institute Convention.** Contact: Bank Administration Institute, P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

Sept. 22-23, Washington, D.C. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 22-24, Washington, D.C. — **Federal Computer Conference,** co-sponsored by the Federal Computer Conference (FCC) and Datamation Magazine. Contact: FCC, P.O. Box 368, Wayland, Mass. 01778.

Sept. 22-24, Gaithersburg, Md. — **National Conference of Standards,** sponsored by the National Bureau of Standards and the National Conference of Standards Laboratories. Contact: Brian Belanger, B032 Physics Building, National Bureau of Standards, Washington, D.C. 20234.

Sept. 22-24, Sao Paulo, Brazil — **Computer Auditing and Control.** Contact: Long & Associates, 820 Tioga Ave., Bethlehem, Pa. 18018.

Sept. 22-24, Dallas — **Introduction to Teleprocessing Software.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 22-24, New York — **The Automated Office.** Contact: the American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 22-24, San Francisco — **Minicomputers and Distributed Processing.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60 St., Chicago, Ill. 60637.

Sept. 22-24, New York — **Writing for Results: A Course for Computer Professionals.** Contact: American Management Associations, 135 W. 50 St., New York, N.Y. 10020.

Sept. 22-25, Philadelphia — **Conference for Management Information Systems.** Contact: the Society for Management Information Systems, 111 E. Wacker Drive, Chicago, Ill. 60601.

Sept. 22-25, Chicago — **Software Package Conference & Exposition,** sponsored by Infosystems Magazine. Contact: Professional Exposition Management Co., Inc., Suite 545, 222 W. Adams, Chicago, Ill. 60606.

Sept. 22-26, Rockville, Md. — **Applied Time Series Analysis.** Contact: Continuing Education Institute, Suite 1030, 10889 Wilshire Blvd., Los Angeles, Calif. 90024.

Sept. 22-26, Washington, D.C. — **Compcon Fall '80.** Contact: The Institute of Electrical and Electronic Engineers, P.O. Box 639, Silver Spring, Md. 20901.

Sept. 22-24, New York — **The Automated Office.** Contact: The American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 23-25, Boston — **Semicon/East '80.** Contact: Mathews and Clark Communications, 410 Cambridge Ave., Palo Alto, Calif. 94306.

Sept. 29- Oct. 1, New York — **Comparative Data Base Management Systems Symposium.** Contact: The Institute for Science and Public Affairs, 1370 Ave. of the Americas, New York, N.Y. 10019.

Sept. 22-26, Chicago — **Computer Auditing.** Contact: RHY Consultants, 1444 Balsam St., St. Paul, Minn. 55122.

Sept. 22-26, Washington, D.C. — **Advances in Electronics Technology.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

Sept. 22-26, Boston — **Improving Office Productivity: Analysis & Design Techniques for Manual Systems.** Contact: American Management Associations, 135 W. 50 St., New York, N.Y. 10020.

Sept. 23-24, Winston-Salem, N.C. — **Records Management and Information Systems Equipment Exhibit and Conference,** sponsored by the National Micrographics Association and the Association of Records Managers and Administrators. Contact: Brad Simpson, P.O. Box 1387, Greensboro, N.C. 27402.

Sept. 23-25, Denver — **Introductory APL.** Contact: STSC, Inc., 7316 Wisconsin Ave., Bethesda, Md. 20014.

Sept. 23-26, Washington, D.C. — **Hands-On Pascal Workshop.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405. Also being held Sept. 30- Oct. 3 in San Diego.

Sept. 23-26, Portland, Ore. — **Structured Program Design.** Contact: Langston, Kitch and Associates, Inc., 715 E. 8 St., Topeka, Kans. 66607.

Sept. 24-25, Lincoln, Neb. — **The Office of the Future — Today,** sponsored by the University of Nebraska-Lincoln and the Data Processors Association. Contact: University of Nebraska-Lincoln, Center for Continuing Education, 33 and Holdrege, Lincoln, Neb. 68583.

Sept. 24-26, New York — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 24-26, Chicago — **Computers in Manufacturing.** Contact: The American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 24-26, Washington, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 24-26, New York — **Data Processing Operations Management.** Contact: The University of Chicago, Center for Continuing Education, 1307 E. 60 St., Chicago, Ill. 60637.

Sept. 24-26, Boston — **DP Disaster Recovery Workshop.** Contact: EDP Recovery, Inc., 400-2 Totten Pond Rd., Waltham, Mass. 02154.

Sept. 25, Dallas — **Automated Rerun and Tracking System.** Contact: University Computing Co., UCC Tower, Exchange Park, Dallas, Texas 75235.

Sept. 25-28, Philadelphia — **Personal and Business Computer Show.** Contact: National Computer Shows, P.O. Box 678, Brookline Village, Mass. 02147.

Sept. 25-26, Sao Paulo, Brazil — **Advanced On-Line Systems Measurement.** Contact: Long & Associates, 820 Tioga Ave., Bethlehem, Pa. 18018.

Sept. 28-Oct. 1, San Diego — **Lasers in Graphics.** Contact: Dunn Technology, Inc., 1131 Beaumont Circle, Vista, Calif. 92083.

Sept. 29-30, Chicago — **Successful Selection of Minicomputers.** Contact: RHY Consultants Inc., P.O. Box 21026, St. Paul, Minn. 55121.

Sept. 29-30, Salt Lake City, Utah — **Integrating Word Processing & EDP.** Contact: Harvard Laboratory for Computer Graphics, 48 Quincy, Cambridge, Mass. 02138.

Sept. 29-30, Newton, Mass. — **The International Standard X.25 Interface Protocol for Packet Networks and Related Network Protocols.** Contact: McGraw-Hill Conference Center, 1221 Ave. of the Americas, New York, N.Y. 10020.

Sept. 29- Oct. 1 — **Essentials of Budgeting for Operating Managers.** Contact: American Management Associations, 135 W. 50 St., New York, N.Y. 10020.

Sept. 29- Oct. 1, Washington, D.C. — **Effective Data Systems Development.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 29- Oct. 1, New York — **Automating Your Office Today.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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# User Videocassette Courses Set For Personal, Business Needs

DALLAS — A series of videocassette courses on such topics as personal and business computing and computer software have been released by Evolution 1, a division of Electronic Data Systems Corp.

The video courses are aimed at corporations, schools and retail computer dealers and can be used for management development, sales training and computer familiarization programs.

In all, there is a total of five cassette series. The first two cassettes, "Personal Computing" and "The Bottom Line," are introductory courses designed for use as sales tools in computer retail stores.

The third series, "Basic Training," is a four-cassette and four-workbook program that gives individualized instruction on programming languages. The lessons cover an introduction to Basic, implementation of programming loops and input statements, the programming of simple games and other exercises of microcomputer programming.

The fourth series, "Little Computers . . . See How They Run," is an eight-cassette program that attempts to dissect the basic workings of the computer.

Finally, "Business Computing . . . Cut Down to Size" was designed to educate the student on the key issues of computers in business.

Prices for the individual cassette series range from $250 for "Personal Computing" to $375 for the data communications cassette in the "See How They Run" series. The cost of the entire courses start at $1,350 and run up to $2,700.

Information on the videocassette programs and future topics can be obtained from Evolution 1 at 14580 Midway Road, Dallas, Texas 75234.

'You Know, Chuck, I Think You're Carrying This Operations Security Business a Little Too Far.'

## Spring Directory Features Listings Of Top Execs

PHOENIX — The Spring 1980 edition of the Directory of Top Computer Executives is now available and features more than 7,600 listings of the Fortune "Double 500," plus nonindustrial companies and governmental agencies with large computer installations.

The directory, published twice yearly, lists the top computer executives of each company and includes information on mainframe type and company address and phone number.

The listings are cross-referenced geographically with 12 major industry/government types for complete and easy data retrieval.

A single copy costs $95 and additional copies cost $60 each. An annual subscription costs $150 for the two yearly issues from Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

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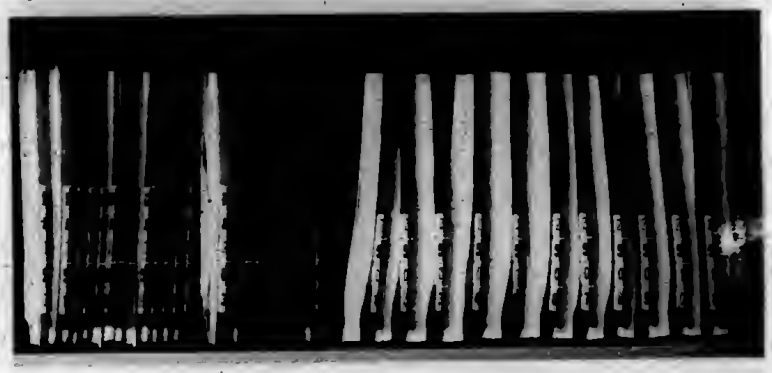

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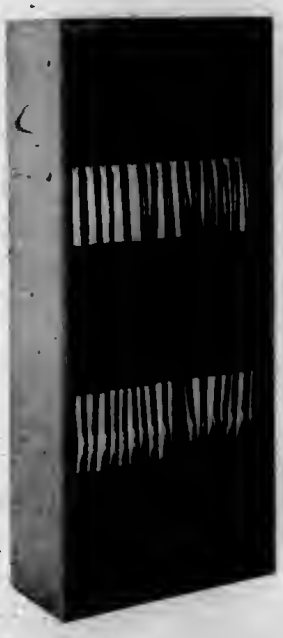

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# Courseware Exchange Enrolls Schools

SANTURCE, Puerto Rico — An International Systems and Courseware Exchange (ISCE) has been established to serve as a clearinghouse for schools, businesses and professionals to lease their proprietary courseware and to become aware of existing programs and thus avoid duplication.

Licensing fees will reportedly enable participants to recover courseware development costs.

Providers who wish to license their courseware on an annual lease basis should send a description of the product to ISCE to be published in an annual catalog. Users must specify their needs and their computer configuration.

The first catalog will be published in January 1981, and entries must be received prior to Nov. 1.

Providers and users will be charged $25 per item, but will receive a free catalog which will otherwise cost $10. Annual licensing fees for the software will vary with each specific program.

Catalog entries dealing with administrative or business applications should be mailed to Howard Baldwin, Registrar, University of Akron, 3230 Miles N.W., Canton, Ohio 44718.

Educational or professional applications should be sent to Swen Larsen, Dean of Science and Technology, World University, Barbosa Esq. Guayama, Hato Rey, Puerto Rico 00917.

John Earle Associates, Inc., is at ISCE Catalog, P.O. Box 12213, Loiza Station, Santurce, Puerto Rico 00914.


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# Service Lists User Meets And Projects

SCOTIA, N.Y. — The Bibliographic Retrieval Services, Inc. (BRS) is now inputting on-line user groups' notices of meetings, announcements and projects on its BRS NEWS file.

The offering was designed to prevent user groups from duplicating efforts and enable them to keep abreast of interesting developments, BRS said.

The user group news will appear as a separate document in the BRS NEWS file so searchers may opt to print it or not. The news will be updated daily and can be accessed anytime during BRS operational hours. It will be available at the regular connect hour rate.

Notices should be 250 words or less, include contact person, phone and terminal numbers and be sent to BRS Customer Service, 702 Corporation Park, Scotia, N.Y. 12302.

# Industrial Robots To Be Highlight Of Meeting

DEARBORN, Mich. — Industrial robotics will be the focus of a three-day meeting here this fall sponsored by Robotics International (RI), the Society of Manufacturing Engineers (SME) and the Robot Institute of America (RIA).

Scheduled to take place Oct. 28-30, the Robots V conference and exposition will be aimed at present and future users of industrial robots. A total of 25 technical presentations in seven sessions will concentrate on implementation, application and technological breakthroughs.

Registration fees for the conference and exposition are $360, and $310 for RI, RIA and SME members and affiliate members. Fees include a set of available papers, three luncheons and coffee breaks. Registration for the exposition only is $3, or $2 for sponsor society members.

Additional information on the event can be obtained from Patricia Van Doren, Technical Activities Administrator at SME headquarters, P.O. Box 930, Dearborn, Mich. 48128.

See page ___ in Buy/Sell/Swap

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# Datapro Sets Seminar Series

DELRAN, N.J. — The Datapro Research Corp. will present a nationwide series of 21 information processing seminars between Sept. 15 and Nov. 21. Sites for the seminars include New York, Chicago, Los Angeles, San Francisco, Dallas, Houston, Atlanta, Denver and Washington, D.C.

They will cover data communications, teleprocessing software, distributed systems, systems analysis and design, DP project management, data base management systems, operations management, minicomputer systems, computer performance measurements, word processing, electronic mail, automating the office and micro/-personal computers.

The seminars are also being offered on an in-house basis, Datapro said, adding in-house versions are conducted for a standard fixed fee which includes program presentation and a reference notebook for each attendee.

The free 48-page catalog details course outlines, instructors, dates, locations, fees and discounts.

Datapro is located at 1805 Underwood Blvd., Delran, N.J. 08075.

# Honeywell Plans Courses On Security, Auditing

PHOENIX — Computer security, auditing and crime investigation will be the subjects of four-and-a-half-day seminars by Honeywell, Inc.'s Systems Sciences Services at Cape Cod and in Washington, D.C., this fall.

The "Three-in-One-Seminar" will present an overview of how computer security, privacy, auditing and crime control techniques can be used to manage information system vulnerabilities. The Cape Cod seminar is scheduled for Sept. 22-26 at the Sheraton Regal Inn in Hyannis, Mass. In Washington, D.C., the seminar will take place Oct. 27-31 at the Tyson West Park Hotel, McLean, Va.

The registration fee is $750, which covers all seminar materials and five luncheons, but not lodging. Special room discounts, however, are available through Honeywell, the vendor said.

Additional information and registration forms are available from the Registrar, "Three-in-one Seminar," Honeywell Systems Sciences, P.O. Box 6000, Mail Station T99-4, Phoenix, Ariz. 85005.

# Blegen Elected Adcu President At National Meet

CHICAGO — August Blegen of the Pillsbury Co. was elected president of the Association of Data Communications Users (Adcu) at the group's recent national conference here.

Also elected as officers were Martin Cernese of Avis Rent-a-Car, Inc., first vice-president; Richard Wallace of the Hartford Insurance Group, second vice-president; Lew Haring of Chase Manhattan Bank, treasurer; and Cornelius Toumey of Merrill Lynch Pierce Fenner and Smith, secretary.

# Cahners Slates Newsletter For Recruiters

BOSTON — Cahners Publishing Co. is launching a twice-monthly advisory newsletter for management and agencies who recruit engineers, computer professionals and other technical specialists.

The newsletter, "Recruiting Engineers and Computer Professionals," will provide surveys, tutorials, news and analysis of issues associated with the task of locating professionals.

The editor, Beth Paper, can be reached at Cahners Publishing Co., 221 Columbus Ave., Boston, Mass. 02116.

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# North Star Horizon Excels in Performance

By Hillel Segal

For a complete system priced less than $7,000, the North Star Computers, Inc. Horizon produced results that were nothing short of astounding. Its run-times in the Series 1 benchmark testing program of the Association of Computer Users (ACU) challenged those systems costing far more. And, as the studies of computers priced less than $15,000 come in, it is clear that the Horizon is a pace-setter.

The strength of the North Star showing in this set of system comparisons is most evident in the accounts receivable problem. In this test, the Horizon's time of 1:57.7 is better than any system tested during Series 2, which covered computers priced $15,000 to $25,000.

Included among those which North Star beat on this test were twelve systems, each priced more than twice as high as the Horizon for a comparable configuration. All were tested in Basic, if that language was offered by the manufacturer.

In the scientific/engineering problem, the Horizon's time of 12:01.9 is also impressive. It remains the fastest performance of that test in the less-than-$15,000 range, and bettered the 12-system average for systems costing $15,000 to $25,000 by more than one minute.

It is worth pointing out, though, that the fastest system in Series 2 for the scientific/engineering problem, the Wang Laboratories, Inc. 2200VP, finished this test in 2:05.8. So although the North Star computer performed better than the average for systems in the higher price range, it could not come near the speed of the top entry.

### Hardware Enhancements

Both the Wang 2200VP and the North Star Horizon use mathematical functions implemented in hardware to speed number-crunching operations. With the Wang system, a set of matrix operations available in Basic was used to optimize performance.

On the Horizon, an optional floating-point math module was included with the system tested, and used together with a special version of North Star Basic. Without the optional hardware, the Horizon could not be expected to deliver such dramatic results.

But while recounting its outstanding finish in two key applications problems, it is only fair to note an area of weakness uncovered during the benchmark process. In the ease-of-use test, the Horizon lagged behind, requiring 230 keystrokes to edit a nine-line file according to the script. This is the greatest number required of the six systems tested so far in Series 1.

The Basic-environment editor is line-oriented, and requires the user to memorize instructions which are entered through a standard, cursorless keyboard. Its purpose is to allow greater flexibility. The user can configure the system with either a CRT or printing terminal of virtually any make.

But the price paid for this versatility is a certain amount of inefficiency and reduced convenience when writing or revising software. "I didn't like it at first because I found it tedious," a customer commented.

In performing the editor test, the independent consulting firm which prepared the benchmark reports posted a reference card on the CRT, and observed that combinations such as "Control-G" for displaying a line and "Control-I" to begin an insertion became committed to memory after an hour or so of entering programs into the system.

**This is the 14th in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member non-profit organization.**

The Horizon system tested was supplied with a Soroc-120 CRT terminal. Included in the configuration were a pair of minidiskettes, an Anadex dot matrix character printer, 64K bytes of memory and the floating-point arithmetic board. The disk operating system and Basic interpreter are supplied at no extra charge, and the entire package was quoted at $6,911.

The Horizon uses 5-¼-in. minidiskettes, but since they are double-density and dual-sided, each holds 358K bytes of data. Less expensive single-sided diskettes are also available. A Winchester-technology hard disk with 18M-byte capacity is offered as well.

### Diskette Speed

In the I/O-intensive test, which involves storing and retrieving data from the diskettes, the Horizon again delivered an outstanding performance, finishing the job in only 10.1 seconds. This was better than any of the Series 2 systems, and took the early lead in the series 1 testing program as well. North Star builds its own disk drives, and those supplied with the Horizon are said to have "fast-stepping" capability to reduce access time.

Because the system is built around the S-100 bus, extra equipment is available from other manufacturers. Real-time clocks, digital to analog converters, music synthesizers and other specialized items are available off-the-shelf. In fact, North Star's floating-point board is available separately for use in other S-100 based systems.

The "mix-and-match" flexibility of the Horizon brings with it added responsibilities for the user. Each unit must be personalized according to the accessories, terminal and printer that will be in use. Assistance from the dealer supplying the package will be needed unless the customer is relatively sophisticated. The Horizon is not a ready-to-run system that can be taken out of the box, plugged in and turned on.

Supplied with the computer are North Star's disk operating system, a program monitor and the regular or floating-point Basic, depending on whether the optional board is in use. Pascal is also offered by North Star.

The CP/M operating system is available on compatible diskettes from other sources, and this brings with it several other languages and a variety of applications software.

North Star reportedly plans to offer its own CP/M operating system in the future; currently, they do not actually support it, but a technical representative said personnel at the factory who are familiar with most versions of CP/M are accessible via the company's hotline.

One disadvantage noted during testing is that the North Star Basic requires the user to specify in advance the size of any files created during a program run. The program aborts if an attempt is made to write a larger file than specified.

In surveying users of the Horizon, we discovered it is popular in educational settings. Two high schools and one university contacted were using the equipment for class projects; the university was running it up to 20 hours a day. Common applications in the business world were accounting and word processing.

North Star now sells software for word processing, automatic letters, general ledger and data base management. But these are relatively new offerings; application software is an area which North Star entered only recently.

Next week: we look at the Cromemco, Inc. System Two.

## SCOREBOX

**System: North Star Horizon**
**Current Price: $6,911**

**SERIES 1 RESULTS**

| | | TIME |
|---|---|---|
| C-1 | Scientific/-Engineering Problem | 12:01.9 |
| C-3 | Accounts Receivable | 1:57.7 |

**OTHER BENCHMARK RESULTS**

| | C-1 | C-3 |
|---|---|---|
| Perlec PCC 2000 | 28:48.4 | 8:04.3 |
| Cromemco System Two | To be covered in future issues | |
| Texas Instruments 771 | | |
| Vector Graphic System B | | |
| Decision 78 | | |

### About the Author

*Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and several other foreign countries.*

*One of the association's key activities is the publication of its "Benchmark Reports." Each month a new report is produced covering another computer system.*

*In addition, ACU publishes seven bi-monthly newsletters for users of small computers, midi computers, large computers, time-sharing systems, distributed processing systems, word processing systems and home and hobbyist computers.*

*A complete set of sample copies of each of ACU's newsletters and complete information about membership in ACU is available from the ACU at P.O. Box 9003, Boulder, Colo. 80301.*

# McGraw-Hill Schedules Meet On Telecommunications in '80s

SAN FRANCISCO — "Telecommunications in the 1980s: A Resource for Growth" will be the theme of a two-day conference sponsored by *Data Communications*, a McGraw-Hill magazine, on Sept. 8-9 here at the Hyatt on Union Square.

The conference is intended for non-technical executives who have ultimate responsibility for managing the flow of information in their organizations.

Lecturers Dr. Howard Frank, president of Network Analysis Corp. (NAC), and Norman Brust, NAC's vice-president of client services, will focus on such issues as underlying technologies and vendor offerings, new approaches to information flow, the industry and regulatory environment, managing the planning process and network strategy tactics, the conference sponsor said.

The attendence fee is $475. Further information on the conference is available from the McGraw-Hill Conference and Exposition Center, Room 3677, 1221 Ave. of the Americas, New York, N.Y. 10020.

# EDITORIAL

## The Hacker Mentality

"A person who makes constant small and unimportant modifications to a computer program for enjoyment rather than to improve the program" is a "hacker," according to an interesting article on computer addiction in the August issue of *Psychology Today*.

Actually, the full meaning generally attached to that epithet encompasses more than mere overindulgence in the cerebral pleasures of programming.

In "The Hacker Papers," musings by students at Stanford University's computer center, *Psychology Today* has assembled a telling portrait of the skepticism these students have about the merit of cloistering themselves, for what might be the duration of their early adulthood, within a "concrete-and-glass" playground.

They know that this cloistering entails a rejection of alternatives for developing themselves and for encountering the world. In an accompanying article, Stanford psychologist Philip G. Zimbardo alludes to this rejection as symptomatic of an entire generation's disenchantment.

"Not just in schools but in society as a whole," Zimbardo observes, "the hacker mentality is upon us, with or without the computer as a rationalization for putting other people at the bottom of our priority stack."

Stanford student Kenneth Peter wrote in the first hacker paper, which was posted in the computer room used to interact with the university's Low Overhead Time-Sharing System, that "when one enters this building through the glass doors, one steps into a different culture. Fifty people stare at terminal screens."

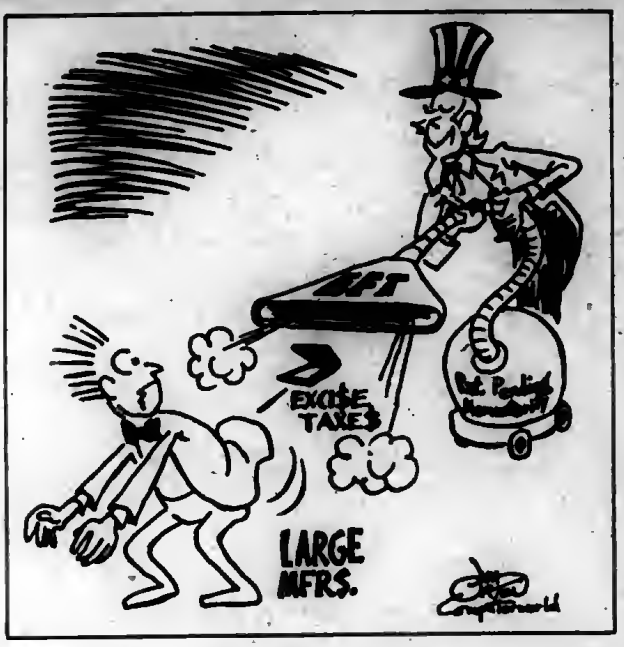
Peter described these people as bright, self-contained ("their entire social existence usually centers around one another") and deliberately predicating virtually all aspects of their lives on computer technology. "The computer is a modifier of personalities," he warned.

Many hackers do not become DP professionals and many DP professionals were never hackers. But consultant Barry A. Stevens' recent In Depth article [CW, July 21] suggested what personality traits hackers might tend to have after leaving university computing environments.

A survey of about 6,000 people conducted over a period of eight years found DPers to be "more cool and impersonal than other personnel," Stevens wrote, and to be "very perceptive, more persevering — even dogmatic, more cautious and hesitant and more pragmatic" than non-DPers.

Further, the DP professional "may harbor unrealistic feelings of inadequacy and may be distracted by moods of defeat or failure. More often than not, he worries over past mistakes and seeks approval of others," Stevens continued.

Managers of information systems will be hackers of a sort themselves if they fail to acknowledge these psychological factors as the substance of what they purport to manage.




# DATA PAST

### Five Years Ago
### Aug. 20, 1975

WASHINGTON, D.C. — Many state and local government agencies were wasting DP dollars on federally funded projects, a report of the U.S. General Accounting Office found. Some agencies were leasing equipment for short periods of time without considering saving money through purchasing; others were excluding certain sources of supply even though these sources offered lower prices; and still others were purchasing equipment without exploring shared processing.

### Eight Years Ago
### Aug. 23, 1972

SACRAMENTO, Calif. — Gov. Ronald Reagan signed legislation that allowed the creation of four new data centers in the state as part of a master plan to consolidate computer operations. The four centers would be devoted to business and services, state colleges, law enforcement and revenue. A fifth, for human relations, was planned. Funds totaling $30 million for operation of the data centers had been approved and included in the new state budget.

# LETTERS

### Distorted Idea

In "Programmers Seen Needing Fewer Skills" [CW, July 28], which reported on the views of sociologist Philip Kraft, many statements were made to which I take umbrage.

Prof. Kraft may have extensive knowledge of the programmer/management relationship, but it is easy to see that he does not have a full understanding of what modular programming is nor does he seem to have an understanding of what a programmer must do when writing a program.

The "three historical periods" basis upon which Kraft builds his hypothesis is as solid as a one-legged stool.

The first period is historical (it is always nice to have at least one segment of a hypothesis that cannot be disproved) and so it may be considered fact.

The second period is current, and supposedly programmers are treated as clerical workers in a factory-style production environment! It was in his discussion of this period that Kraft made his error. Modular programming involves programs made up of many performed modules — not, as Kraft stated, "sophisticated software systems comprised of very simple-minded modules."

In todays' environment, most major systems consist of multiple subsystems; each subsystem is made up of numerous programs. Within these programs are the modules.

No mention is made of the clerical worker (possible senior clerical worker) who is responsible for the control programs (or modules) or who sets up the arrays that would be utilized by the performed modules.

As for this being a period of "deskilling,' the opposite is true. If a person is going to be a generalized applications programmer, he will need to know some of the following languages: Ansi Cobol, Cobol, Basic, Fortran, PL/I and Algol.

Today's programmers have many different paths from which to choose when it comes to the type of work they want to do. There are many different types of mainframes and many different sizes — from micros to mainframes. They all need programmers.

Finally, Kraft spoke of the old dooms day prediction that programmers will be reduced to almost nothing. This theory was touted in the early 1960s, but we still have programmers.

The bottom line of this whole reply is that I cannot believe Kraft has any in-depth concept of our field.

James R. Kitchen
Riverdale, Md.

### Disservice to Workers

"Structured Methods Found No Cure-All" [CW, July 28] quoted information systems manager Bob Duolittle, who cast aspersion on the abilities and goals of government workers. As the exclusive bargaining representative for 6,000 government employees at the Navy Ships Parts Control Center in Mechanicsburg, Pa., I want *Computerworld* to know that we resent the attitude represented in the article.

I have worked in data processing within the government since 1964 and am now a computer systems analyst. In all the years I have worked here, I have never seen a more dedicated, hard-working group than the computer personnel at Mechanicsburg. During those years, this group designed, programmed, tested and implemented one of the largest computerized supply systems in the world. This would have been impossible if all we did during those years was sit on our hands waiting for our pay checks and the five o'clock whistle.

Dale E. Weller
President
Local 1156
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READER COMMENTARY/John G. Leyden

# Editorial on FAA Gave Biased View

Over the years, I have found *Computerworld* articles and editorials about the Federal Aviation Administration's (FAA) air traffic control computers to be consistently biased and inaccurate. However, I've always managed to restrain the urge to reply until the July 21 editorial, "Time Bomb," pushed me over the edge.

First of all, the editorial said computer outages are causing countless traffic delays. Wrong! We count them. During the first six months of 1980, computer problems in centers and towers caused 562 aircraft delays and combined with weather for another 455. That's a total of 1,017 delays or 3.5% of the grand total of 29,425 system delays recorded during the January-to-June time frame.

Second, the editorial mentioned an "increase" in software and hardware problems. Wrong again! Computer reliability has increased significantly in recent years. For example, computer interruptions lasting less than one minute dropped from 14,166 in 1977 to 8,483 in 1978 to 6,651 in 1979. Moreover, there has been a similar decline in the number of unscheduled outages of one minute or more. They've dropped from 1,536 in 1977 to 1,146 in 1978 to 873 in 1979.

Next, CW said the present air traffic control system is based on World War II vintage radar and aging first-generation IBM 9020 mainframes. As a point of information, the FAA didn't order its first long-range radar until 1956 and didn't get it operational until 1958. (I believe the Big War ended in 1945.) As for the IBM 9020, it is, of course, based on the IBM 360/65, which is described by the manufacturer as "third-generation" equipment.

Another misstatement was that many computer outages have been the result of memory overload. Although we have had cases of computer overload in the enroute centers, subsequent analysis disclosed that the real problem was the computer program. In each case, we were able to free up additional capacity by changing the program.

CW's use of midair collision statistics to support the assertion that computer outages are creating serious hazards also is misleading. Actually, the majority of near midairs involve general aviation (nonairline) and/or military aircraft operating outside the traffic control system — that is, under visual flight rules in uncontrolled airspace.

In fact, I might add that the statistics on near midair collisions themselves probably are misleading. For example, does the increase in the number of reports over the past five years really represent an increase in incidents or does it merely reflect better reporting as a result of a special program instituted by the agency in 1975? It may be a bit of both.

But if the number of near midairs really is increasing, it would seem logical that the number of actual midairs also would increase. Yet these figures have remained relatively constant over the past 15 years.

Getting back to the subject of delays for a minute, the editorial noted that delays cost the airlines more than $500 million a year, and the reader was left to conclude that the computer outage problem is the snake-in-the-grass here. But, as already noted, computer outages are relatively insignificant as a cause of delays, when compared with adverse weather, which accounts for 85% of the total.

Finally, CW said the FAA should stop wasting its energies on denials and get on with the job of improving the system. Well, we'd like to, but occasionally we have to take time out and deal with publications like CW.

*Leyden is chief of the Public & Employee Communications Division in the FAA's Office of Public Affairs.*

READER COMMENTARY/Michael Fuerst

# Systems Career May Be Harmful to Your Health

Physicians Meyer Friedman and Ray Rosenman, in their book *Type A Behavior and Your Heart*, described a "Type A" personality profile associated with individuals susceptible to heart disease. Meyer and Rosenman wrote, "Type A behavior is an action/emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time and, if required to do so, against the opposing efforts of other things or other persons."

They claim that 50% of Americans show Type A characteristics if placed within the proper environment. Employment environments often provide this catalyst.

In the past few years, these findings have achieved wide acceptance in the medical community. Intriguing, disturbing similarities exist between the Type A and data processing personality profiles, the latter described by Barry Stevens in his recent In Depth article [CW, July 21].

A Type A person has an insatiable sense of time urgency — trying to compress more activities and/or accomplishments into a limited amount of time and establishing self-imposed deadlines. Such behavior often inhibits creativity by forcing the individual to use stereotyped or established solutions to problems. The Type A counts the number, rather than evaluates the quality, of his accomplishments.

The DPer strives for completion of short-term tasks and has an obsession with details — that is, tangible accomplishments — and cannot appreciate the relevance of long-term goals. The DPer makes conservative choices, avoiding unorthodox and possibly risky practices. An attempted solution, if unsuccessful, can stymie a many-pieced system. But in contrast a DPer is a perceptive problem solver. What may be "conservative" in a DP sense probably requires innate problem-solving talent.

A Type A person often exudes a self-assurance which conceals an underlying insecurity caused by concern with the pace at which prestige and accomplishments accumulate. Stevens described the DPer as unpretentious, but harboring feelings of inadequacy, and attributed the latter to the range of

*(Continued on Page 36)*

SOCIOLOGY OF COMPUTING/Robert L. Glass

# Perusing the Product or Its Symptoms?

What is the final product of a software construction effort?

Does that seem like a dumb question? Everybody knows it's the program, right?

But what is a program? (Now this is beginning to sound like one of those philosophical discussions that starts out, "If a tree falls in the forest and there is no one there to hear it . . .")!

### One True Representation

Really, now, this is an important question. A program is code, of course. Is it source code? Is it object code? Is it the magnetic tape or disk that holds the code? Is it the documentation that describes that code? Is it the program listing for that code?

Most people, upon giving the issue some microseconds of thought, would say "all of the above." The final product of a software construction effort is the code in all of its forms, the medium that holds that code, its documentation and its listing.

Now consider the ability of the software product to be evaluated. Suppose further that you are the manager of a software construction effort, and you want to review the quality of your product. Personally.

How do you go about evaluating the code? Well, that's nearly impossible, at least when the code is in machine-readable form. How about the medium? Again, impossible. That leaves the documentation and the listing, both of which are readable. Which do you choose?

If you said "the documentation," you picked the obvious and easy answer. You also picked the answer 95% of all software managers would have chosen.

You also chose wrong!

The fact of the matter is, the only thing that truly represents a software product is its listing. It is the only fully accurate, up-to-date representation of the code the computer executes (assuming a reasonable degree of goodness in your configuration management practices!).

This is *not* to say, of course, that a listing is an easy way to understand a program product. Even a well-commented listing, of which there are all too few, is hard to read. The help of at least a program overview document to find your way around is pretty essential.

But this is to say that documentation is the wrong way to evaluate a software product.

### Behind Software Quality

Consider, for example, the attributes that make up software quality. How many of these can you evaluate by reading the documentation?

- Understandability of the program can be evaluated largely only by reading the listing.
- Completeness of the program must involve evaluating both the documentation and the listing.
- Portability of the program can largely be evaluated only be reading the listing, although a special portability overview document (normally not written) would help.
- Maintainability of the program must be evaluated both from the listing and the documentation.
- Testability of the program can probably be evaluated from the documents.
- Usability of the program can largely be determined from the user document.
- Reliability of the program is mostly determined from experience.
- Efficiency of the program is evaluated by reading the listing and by program execution.

In other words, the software manager who tries to evaluate his software product by reviewing the documentation is missing a lot. He's evaluating the product by its symptoms, not by its attributes.

There may be those of you who are saying, "A properly managed documentation effort will accurately reflect a software product."

There may be others of you who will snicker at that statement, recalling how many times you have seen "properly managed" software documents thought to be accurate which the programmer knew were not.

The fact of the matter is, a manager who does not read program listings will never know whether the documentation is correct or not. And programmers on "properly managed" projects have been known to take advantage of that fact.

What is the point of all this?

We software folk are churning out billions of dollars worth of software annually. The fabric of our society is

*(Continued on Page 34)*

HUMAN CONNECTION/Jack Stone

# Is Trade Press on the Right Track?

"I don't expect the trade press to offer us the same material as *Time* or *Playboy*, but it could be a lot more humanistic. I don't think I'm jaded, even though I've been in the business 12 years, but I've lived through an awful lot of product announcements, and the excitement of reading about new machines and software systems just isn't there for me anymore."

This was the terse response from a DP manager and friend of mine when our luncheon conversation drifted around to the DP trade press. I chanced to ask him what he thought about it because I knew he received all the well-known trade magazines and newspapers.

He went on to say, "I do scan the industry news sections, which I feel vastly improved over the years, although I think that 11 years of IBM antitrust trial coverage is about enough.

"I don't think I'm too harsh in my judgment. I know very well that hardware prices are coming down and that means we can buy more computing power and storage; and that packaged software has some great advantages and some *caveats;* and that there are many more meetings that I would like to attend that I can afford to; and when I'm ready to look for a job, I can start my search in the trade newspapers. How much more hot industry news is there?

"Maybe my point is that our own installation is well stabilized since the crazy growth of the '60s and '70s, and any change now is carefully measured and controlled. This is certainly part of the reason there is nothing much in the press that really thrills me."

I'm not at all sure my friend's opinion about the press is typical. Or that mine is either, for that matter. My own interests are the subjects of data processing management, organization, personnel and human communications. Because there are so relatively few of these articles around — although the percentage seems to be slowly increasing as of late — I consider it to be a serendipitous event when I stumble over one of them.

To obtain some measure of what the major trade publications think about these subjects, I made a quick scan of the "Contents" list in recent issues of six of the better known ones and found that not one of them has a major section or department assigned to the "human side" of the business (although they all had at least one article in the general area).

Perhaps the editors feel readers don't really need this information. However, this doesn't jibe at all with my experience. Maybe the editors believe that it's not the role of the trade press to address such subjects in the same depth as it does hardware or software. But if this is so, where does the practitioner go to get a continuous flow of useful articles in the area?

Or do the editors think readers aren't really that interested? If this is the case, then they're missing a good bet for livening up their publications; because I believe an interesting story on computer crime (particularly how one was detected) or user-DP relations (namely, how to succeed at same) or career growth (with advice on how to keep your people) is very, very important to readers these days.

Here's a chance to express your opinion by completing the questionnaire.

## Opinions on DP Trade Press

1. My job is that of:

| | | | |
|---|---|---|---|
| Executive | ___ | Systems Analyst | ___ |
| Programmer | ___ | Operator | ___ |
| DP Manager/Supervisor | ___ | End User | ___ |
| Other _____ | ___ | | |

2. I am employed in:

| | | | |
|---|---|---|---|
| Private Industry | ___ | Government | ___ |
| Education | ___ | Other _____ | ___ |

3. Here's how I rank trade press coverage, relative to my personal interests and needs (5 is high, 1 low):

| | | | |
|---|---|---|---|
| Hardware | ___ | Software | ___ |
| Applications | ___ | Industry News | ___ |
| Editorial | ___ | "Humanistics" | ___ |
| Employment Ads | ___ | | |
| Other _____ | ___ | | |
| Other _____ | ___ | | |

Comments (use separate sheet, if desired):

_____

_____

_____

Mail to Jack Stone, Suite 222, 2929 Wisconsin Ave. N.W., Washington, D.C. 20007.

# Perusing the Symptoms

*(Continued from Page 33)*

now intricately interwoven with software-controlled threads. Mostly, we are doing our job well.

But nobody — repeat, nobody — is doing the job of evaluating the software product we are producing. Programmers are bored with each other's code. Testers don't have to look beneath behavior. Quality assurance people control without understanding.

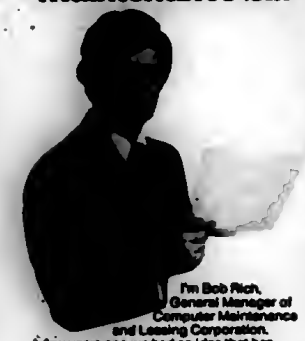
And managers? Managers think they are evaluating the product by reading the documentation. In fact, there is a trend toward calling the program product a "software package document." But in reality, managers are kidding themselves. They are not evaluating the program product, either.

So beware, society. Until software managers role up their sleeves and take responsibility for evaluating our software products — by reading listings — we are all at risk.

The software product *must* be evaluated by the manager responsible for its creation.

'Here at MET, Leaders in CICS and OEM Products It's SOP to Wish a Happy Retirement to a Great MIS Like D.U. Hodge, or DUH as We Came to Know Him.'

"I'll pay your IBM maintenance bill"



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**National Advanced Systems**
**The Compatible Computer Company**
A subsidiary of National Semiconductor

# LETTERS

## Natural Barriers

Regarding "Probing the DP Psyche" [CW, July 21], the data seems to reinforce my own belief that there are indeed natural barriers that impede the blend of technology into the higher echelons of business.

They are in some measure a function of the personalities who staff our technological front lines.

So, in answer to the question, "Are we technocrats or are we businessmen?", I submit the following quote from Sir Richard Livingstone, who, sometime long ago and far away, wrote:

"A technician is a man who understands everything about his job except its ultimate purpose and its place in the order of the universe."

Paul Skajuba
Johnston, R.I.

## Borrowing OK

The "Computers and the Draft" editorial [CW, July 28] requires a response.

As a taxpayer, I applaud the decision to borrow manpower, keypunches and computers for registration (not draft, as stated in the editorial headline) instead of creating a new empire for a (hopefully) infrequent event.

As a privacy-conscious citizen, I agree with your privacy concerns, but do not see how the use of borrowed equipment and people materially affects those concerns.

Leland H. Williams
Research Triangle Park, N.C.

## A Note About AWC

First, we would like to express our appreciation for *Computerworld's* comprehensive coverage of the activities of our organization, Association for Women in Computing (AWC). CW's reports on the greater New York and greater Boston chapter meetings gave people a chance to get to know what our organization is doing and what it has to offer to them.

However, with regard to the article "AWC Plans to Boycott NCC '81" [CW, June 2], a couple of corrections are required. The major one involves the statement that the resolution was approved by the AWC membership. It was not approved by the membership, only by the AWC board of directors. I related it to the reporter prematurely since there was and is a companion resolution which is still outstanding to bring this issue to a vote of the full membership.

As the article noted, this matter is still open for reconsideration by the new board as well as by the full AWC membership. One other small point: I spoke of women who believe in "themselves," not in "the cause," as stated in the article.

Linda Taylor
President
AWC
Washington, D.C.

# Systems Career May Pose Danger

*(Continued from Page 33)*

knowledge and the concern with many details required of DP personnel.

In order to achieve enhancement in personal status, a Type A person values the esteem of his superiors above that of his peers. This may lead to the aloofness of DPers.

Two factors can explain the apparent contradiction that although aloof, DPers tend to be group-oriented. First, in a DP environment, getting a system operating requires participation within a group. Second, any group of intense, achievement-oriented individuals require an informal support system. Birds of a feather flock together.

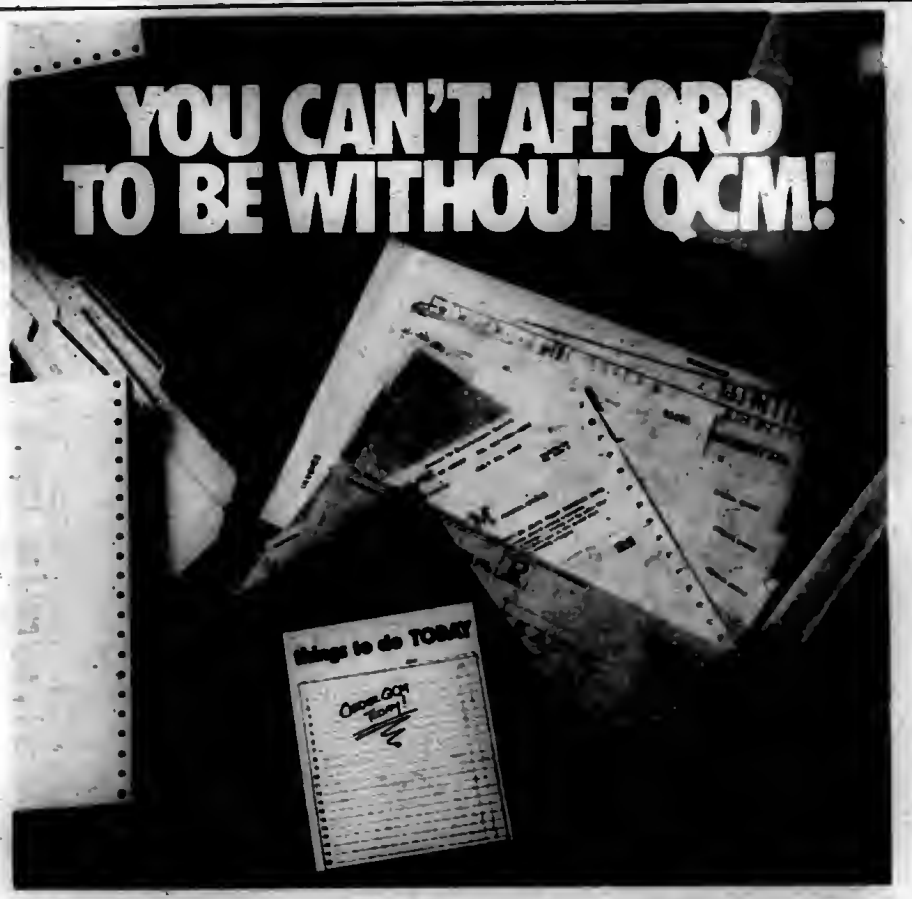
### High Turnover

The quest for status and tangible accomplishments, augmented by a covert insecurity, undoubtedly leads to the high turnover among DP personnel.

Stevens noted no difference between DPers and non-DPers with regard to patience and calmness. This contradicts both the Type A profile and the rest of the DP profile.

Data processing appears to provide a perfect environment for Type A behavior to manifest itself. Progressive psychologists and physicians have and are investigating how individuals can control their Type A personalities. Better understanding of the DP function both in limiting turnover and in improving morale.

*Fuerst is principal investigator for the Army's Construction Engineering Research Laboratory in Champaign, Ill.*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[illegible]

[illegible] Again, [illegible] the best of both, we won't [illegible] at the expense of the other.

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By adding main memory with STC's 3700 Universal Memory System, you will experience an immediate improvement in both throughput and terminal response time. This is true because as your real-to-virtual storage ratio increases, paging activity declines, with a consequent reduction [illegible] Up to a [illegible] are some significant [illegible] which memory [illegible].

Over-initiation is a case in point. As you [illegible] batch jobs or log-on more TSO or CMS users, the increased job load will eventually result in page thrashing and resource conflict. That threshold can be reached long before your CPU is 100% busy.

As illustrated in the graph, a high-speed paging device, such as STC's [illegible] Disk, will [illegible] your system's [illegible] decreasing [illegible] Faster [illegible] your [illegible] dedicated paging storage [illegible] contention on your disk subsystems.

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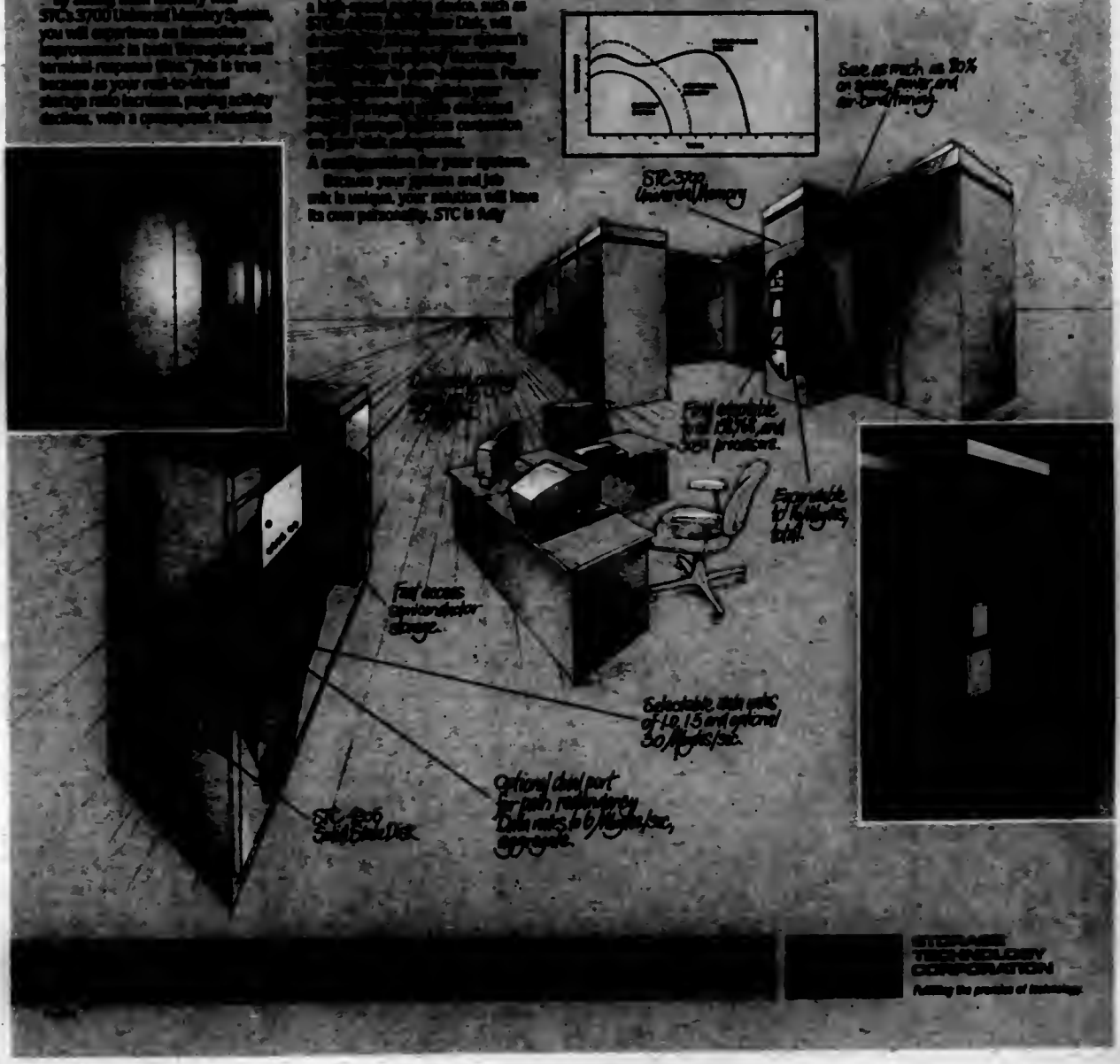
For details, call your local STC sales office. Or write: Storage Technology Corporation, Mail Drop 3M, 2270 S. 88th Street, Louisville, CO 80027. Phone (303) 673-5151.

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# LETTERS

## Experiences With 4341

We have read with interest recent articles in *Computerworld* relating to initial installations of the IBM 4300 systems and the work load and complexity of installing DOS/VSE.

As the first IBM 4341 installation in New Zealand or Australia, we thought your readers might also be interested in our experiences.

Our DOS/VSE conversion involved three major changes:

- From 370/138 to 4341.
- From DOS/VS Release 34 to DOS/VSE Release 35.
- From 3340/3344 disks to a 3340/-3344/3370 combination.

Performance gains have been impressive. In the first stage, still using DOS/VSE Release 34, a 30% throughput gain was observed in batch mode, while many on-line response times were so quick they could not be measured. Unchanged peripherals such as the 3203 printer, 3420 tapes and 3340 disks were a limiting factor on performance.

Implementation of DOS/VSE Release 35 and utilization of the 3370 disk drives was found to double batch throughput on disk jobs compared with use of the 3340s, and the display console operation has proved significantly faster.

Perhaps the most outstanding feature of the DOS/VSE Release 35 software has been its quality. To date, not one bug has been found. A total of five bugs were encountered (in CICS/VS and Sort/Merge II) but fixes were already available for these.

It is perhaps in the area of known problems that advance support from IBM would have reduced the number of typical implementation problems. Nevertheless, the level of IBM support during installation was very good.

A drawback to Release 1 of the DOS/VSE Sipo/E tape is that while it contains the 3705 EP software for Binary Synchronous operation, it does not contain the Vtam or Network Control Program (NCP) components for Synchronous Data Link Control operation. In fact, we were not advised by IBM that it was even necessary to order the NCP software separately. We understand these will be incorporated with the Release 2 Sipo/E tape.

Unquestionably the worst aspects of installing DOS/VSE Release 35 in our "conversion" environment were the substantial amount of work involved in cutting over from Release 34, tailoring of the system and the number of problems encountered in doing so. It was a major exercise requiring one week's planning, two nights on the IBM Data Center 4331 and five full weekends on the MSI 4341 before being operational. Subsequent replacement with the Release 2 Sipo/E is expected to be comparatively straightforward.

A new DOS/VSE installation should not experience the same amount of work. However, the DOS/VSE Sipo/E does require an excessive amount of disk space, and users with less disk capacity than MSI would have a substantial tailoring exercise.

Like many installations, we run an on-line system during the day, with batch production overnight, which prevents concurrent generation of the DOS/VSE system. It seems a serious deficiency of the IBM DOS/VSE software generation procedure that a dedicated machine is normally required, and the whole process is so time-consuming.

Despite these initial problems, we are very pleased with the performance of the IBM 4341 and with the quality of the DOS/VSE software.

*Rankin is corporate DP manager for MSI Computer Services, a division of MSI Corp. Ltd., in Auckland, New Zealand.*

## SCI vs. IBM

On July 1, the U.S. Court of Appeals for the Ninth Circuit handed down an 11-page opinion in the software antitrust suit entitled Symbolic Control, Inc. vs. IBM, reversing the trial court's dismissal. The article "Symbolic vs. IBM Continues Software Pricing Debate" [CW, July 21], was incomplete and at times inaccurate.

1. Contrary to *Computerworld's* article that "for all real purposes [Symbolic] went out of business in 1971" and "Symbolic never won a customer," from April 1972 to April 1974, the National Aeronautics and Space Adminsitration's (Nasa) Ames Research Facility leased Symbolic's ART/70 for $1,000 per month. Although the Nasa lease is not mentioned in the opinion, I told CW about it in a telephone interview. Also, from March 26 through November 1971, Rohr Corp., on a trial basis, leased APT/70 from Symbolic for computer time in lieu of money.

2. I told CW that in September 1974, Symbolic filed its pretrial statement with the court specifying trebled damages of $189 million through 1978. For CW to report that "Symbolic, in its trial papers, said damages include $1.2 million" and then "Those damages were subsequently estimated through 1978 to be $63 million, said Arthur Pfeiffer" creates the *false* impression that Symbolic's actual damage claim is $1.2 million and any larger sum is only the expression of my current subjective wishes.

3. CW reported this case as though it dealt only with acts committed by IBM "after IBM unbundled software in 1969." However, Symbolic charges that IBM failed to price software and related services (including APT) both *before* and after IBM's June 1969 unbundling announcement. The Ninth Circuit understood this and held that Symbolic (incorporated in March 1969) could have been injured by the

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# LETTERS

continuing "adverse competitive effects" of assumed violations committed by IBM prior to Symbolic's business existence.

Accordingly, IBM is legally accountable for earlier violations which caused later injury regardless of IBM's trial defense that "'plaintiff knew,' before entering business, about this or that aspect of IBM's marketing" or that "IBM neither could nor would impose a charge on programs already distributed without restriction and in the public domain."

IBM's "public domain" defense is contradicted by its own documents, some of which Symbolic did not discover until after trial, but which are now in the court record, showing that as late as 1972, (a) IBM gave its customers NC360 Systems Manuals labeled "RESTRICTED DISTRIBUTION," (b) IBM selected users to test new NC360 releases prior to general distribution who signed IBM nondisclosure agreements declaring the NC360 material to be IBM "confidential and proprietary" and (c) in February 1972, IBM released for a *$500 per month* price (12-month limit) its *free* 1971 NC360 model modified to run under the CMS time-shared operating system *without* general interactive APT processing.

The Ninth Circuit recognized the critical effect of *price*, or more accurately *no price*, on a buyer's decision to choose a *free* product over a *priced* one. Even assuming that IBM's *free* NC360 software was superior in quality to Symbolic's *priced* APT/70 software (a factual dispute to be resolved in future trial proceedings), the Ninth Circuit concluded: "We hold that, on this record, IBM has not demonstrated that Symbolic's losses were unrelated to conduct of IBM . . ."

The Ninth Circuit went on to point out that a finding of no impact could only occur if IBM could show an intervening cause, such as plaintiff's "managerial weakness" as claimed by IBM, sufficient "to overwhelm any impact of the federal law violations."

For years, to the best of my knowledge, this case has been the only private software antitrust suit against IBM. Although filed on Nov. 16, 1971, this case has never been mentioned by IBM in its annual reports to shareholders. In general, the press and the computer industry have been unaware of its existence.

Nevertheless, in my opinion the issue of predatory pricing of software from 1964 to date is of sufficient magnitude to be of interest to these groups and the legal community. A judgment in this case finding IBM guilty of monopolizing and foreclosing competition in separate software markets via predatory pricing and an illegal tie-in between hardware and software could greatly affect the entire computer industry.

Arthur Pfeiffer
President

Symbolic Control, Inc.
San Francisco, Calif.

## 'Ego-Filled' Programmers

Whenever I read articles that point to egoless programming as the solution to all our problems, I can't help wondering whether we aren't attempting to contradict history. Throughout history it has been men and women who followed an inner calling and used their imagination to create something unique who have made the greatest contribution to our society. I think of people like Frank Lloyd Wright, Thomas Alva Edison, Albert Einstein, Marie Curie, and Johann Sebastian Bach.

Few of them were egoless. Some were eccentric. While all of them were subject to the criticism of their peers, they did not allow it to rule them or force them to compromise their talent.

I submit that what we need are more "ego-filled" programmers — men and women who take pride in their work, who follow their inner calling in producing something unique, who treat it as their own and have the patience to nurture it through to fruition. What we do *not* need are interchangeable parts of a machine — blobs of humanity that are indistinguishable from one another.

P.A. Anderson

Chicago, Ill.

## Timely Suggestion

Data base processing is now a reality for most large-scale computer outfits. Most shops have developed multiple secondary indexes to achieve inverted accesses to work alongside their one primary index. As a data base grows and sequential processing takes longer and longer, it is the perfect time for alternate primary indexes to come on the scene.

What is an alternate primary index? It is a method of preventing long sequential processes in cases where about 10% to 20% of the data structures contain the information needed. Even the best organized data base can have the sequential blues — meaning, here we go again for another five-hour run.

Simply write a data base utility to extract the keys of the roots you desire to access with one pass of your data base. During this pass, create as many alternate primary indexes as you need on a KSDS Vsam file. Use your daily update system to maintain these new indexes once created.

Now each time you need to access the data base for a special situation, use the alternate primary index as a guide, using qualified GHN calls as you merrily speed through the data base.

How does 80% to 90% faster access sound to you? Well, it sounded great to me, and that is why we now use alternate primary indexing here at Utica National Insurance Group.

D.L. Watson

Utica, N.Y.

## Ready to Spit

If I see another slick sales brochure, I am going to spit!

They contain insufficient technical detail and never contain even the most general pricing information. I get angry when I am required to call the companies again to complain that they have not answered my most general questions.

Most of all, they have delayed my decision-making. What a waste of money.

Stephen B. Waters

Rome, N.Y.


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THE TAYLOR REPORT/Alan Taylor

# NCR User Missing Crux of Argument

In its battle with NCR Corp., Perl-Mack Enterprises of Denver may be missing a real contract breach, in my opinion.

As described in the past two Taylor Reports, in 1977 NCR offered to write three additional software applications at a low ($5,000 total) price in order to win a bid that had been rejected. To convince Perl-Mack that it was serious, NCR also included a contract term in the hardware order that delayed the payment of the 90% outstanding hardware balance — but not its delivery for use — until all the systems were functional.

Delivery was expected in less than six months, but in fact the additional software was never delivered. In the meantime, NCR first obtained payment of the 90% hardware balance by threatening to remove the user's computer and also attempted to collect $26,000 for the more expensive four accounting applications that were delivered in March this year — two years late.

The matter has gone to arbitration, and both the user and NCR have set out their claims.

NCR's failure to supply the software for bank balances, commercial leasing and volume projection as it had contracted has had obvious costs for Perl-Mack. Its staff has had to keep doing these tasks without computer assistance, and equivalent software may yet have to be obtained.

In addition, the company's efficiency in conducting its apartment house business may have been lost, and now the software may have to be obtained at 1980, rather than 1977, prices.

In the claim before arbitration, Perl-Mack's president bases damages on NCR's failure to make a Jan. 31, 1979 deadline for the delivery, which he says was agreed upon. However, when this date quoted by NCR during negotiations in late 1978, the vendor also made an equally clear statement that the date might not be kept.

In fact, NCR district manager David Olivet specifically said that if it was not, then no payment for any of the software would be expected by NCR until all software was delivered and functional.

The letter made no real agreement to maintain the Jan. 31 date. And if the Universal Agreement terms are applied to the Olivet letter, as the user seems to suggest in the claim for arbitration, there is no provision that would permit more than direct damages — the cost of replacing the software and so forth.

What the user does not claim — perhaps because he is in the apartment leasing business, not the computer business — is an earlier contract breach, in my opinion, that seems to have occurred in 1977 and after. This was a breach of NCR's duty, under the contract, to put forward its best efforts to make any indicated delivery date.

### 'Best Efforts' Requirements

John G. Coleman, NCR's regional systems engineering manager, recently set down conditions that the user would have to meet to even stand a chance of having NCR complete the contract. In a letter last March, Coleman demanded that, if NCR were to do anything, it would have the right either to simply write the applications in the way they were currently operating in the user's shop or to make them compatible with the data base approach the user had told NCR it wanted.

This shows — and my investigations have confirmed — that the applications NCR has failed to deliver could be written independently of the accounting software. NCR could have put an independent development team on each or all of them.

Another view of the facts comes to the same conclusion. The fact that the decision as to the basic development approach was still up in the air this March also indicates that NCR, in my opinion, had not even begun to put forward its best effort to deliver the software.

Whether a similar argument can be made for the rest of the software is not particularly clear as yet — but then it may not be legally relevant either. If a breach of contract occurred early, then damages resulting from the breach would extend to the period before the delivery date was missed.

Probably many of the damages that would be consequential for a later delivery date, breach would be direct in the case of the early, best efforts, breach. This would reduce the fight over the legal meaning of the consequential damage clause.

Still, even if Perl-Mack can make a cast-iron case for early, or even repeated, breaches of various agreements, this may not help the user very much at all. In a totally different fight that started just last month, NCR objected to all the arbitrators first selected by the American Arbitration Association. This fight and why it can cost an NCR user its legal rights will be described in a forthcoming report.

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*How Do You Negotiate With IBM?*

# Lawyer Briefs Legal Side of Acquisitions

By Rita Shoor
CW Staff

CAMBRIDGE, Mass. — How do you negotiate with IBM once you have reached the contract stage in the software acquisition process?

You don't. That was the consensus of opinion among attendees here at a session of the recent Computer Graphics Week '80, a conference sponsored by the Harvard Laboratory for Computer Graphics.

"IBM almost removed the lawyer's role [in contract negotiation] with its standard contract," Warren G. Lavey, an attorney with the legal consulting firm Lexecon, Inc., observed.

However, many other vendors are more amenable to negotiating contract terms for software packages, he said.

### Legal Aspect Overlooked

"Systems engineers (SE) and DP managers tend to overlook legal considerations" once the contract-signing stage in the acquisition process is reached, Lavey maintained. The technical specialists feel they have done their work and it is up to the lawyer to cement it, he observed.

An SE or DP manager may become intimidated and confused by the legal issues and jargon of software contracts. Soon, anger emerges about delays in closing the deal caused by negotiations over what seem to be unrealistic or inconsequential concerns, he said.

On the other side of the fence, Lavey noted, the lawyers struggle to describe the applications software and its uses, to provide for the risks involved in the acquisition and use of the software and to ascertain whether the transaction fits into certain legal categories.

He stressed the need for an integration of effort between the technical and legal specialists since "the legal aspects of acquiring an applications software package can turn an attractive package into an unattractive deal."

And the legal ramifications may become even more complex when applied to graphics software packages. Graphics software is "very interactive" with I/O devices such as plotters, digitizers and terminals. For example, a graphics application package is "more closely tied to its hardware" than something like a batch-oriented accounting package, Lavey pointed out.

If the end-user purchases his terminals, plotters, CPU and graphics software from four different vendors and the whole system performs unsatisfactorily, the close software/hardware integration may increase the difficulty of pinpointing the blame, he warned.

The result may be an increase in the number of computer-oriented litigation cases and according to Lavey, an increasing need for lawyers who can understand computer technology.

Since "the legal, technological and marketing concerns which ultimately determine the character of the transaction and the benefits each party will derive" are solidified in the software contract, it is to the system

*(Continued on Page 42)*

# System 2000 Gets Prompting

AUSTIN, Texas — Intel Corp. has unveiled a prompting facility that works with its System 2000/80 data base management system and integrated data dictionary (IDD).

Known as Query/Update By Example (Qube), the menu-driven data manipulation facility increases end-user, programmer and data administrator productivity by prompting the user step by step through a transaction, the vendor claimed.

Qube is reportedly similar to IBM's QBE. The user requests its activation by entering the CICS transaction "QUBE." The facility then requests user identification and lists the records which the user has authorization to access.

Next, it presents a formatted screen of item names followed by spaces for each item specified for that record. At any time, the user can choose to display or update any record related to the one currently being displayed, an Intel spokesman said.

The user enters the record name and Qube automatically follows physical (parent or descendent) or logical (linked) relationships until the new record type is found. Multiple data bases are transparent to the user.

The user can continue through the entire network updating any record type, adding a new occurrence to related records or moving a record wherever desired, according to the spokesman.

Using the IDD, the data administrator defines a logical view which determines the items and records accessible for each user.

The facility is priced at $20,000, Intel said from its Commercial Systems Division, 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

*For Cobol Program Generation*

# 'Score' Now Tackles DOS/VS, VSE

NEW YORK — An interactive version of Score, a Cobol program generator, for IBM DOS and DOS/VS and VSE operating systems has been introduced by Software Design Associates (SDA).

The new version includes a prompter for on-line input with a CRT and carries a guarantee of a full refund if Cobol programmers fail to generate code at least 25% faster within 60 days of installation, the vendor stated.

The price for the basic system is $12,500 and $19,750 for the full-feature system, including a three-day hands-on workshop.

Originally developed in 1968, Score has nearly 500 users in applications of program conversions, maintenance and report writing and test data generation.

An interactive version of Score for IBM OS users was offered by SDA as of June 1980. The product is also available for Univac, Burroughs Corp and Honeywell, Inc. mainframes.

SDA is at 75 E. 55th St., New York, N.Y. 10022.

## *Prime 50s Get APL*

PONTIAC, Mich. — Two APL interpreters that are said to take advantage of the Prime Computer, Inc. 50 series hardware and virtual memory operating system design have been introduced by Mips Software Development, Inc.

The APL/LW — for a large work space with up to 31M bytes per user — and APL/LWSF — for shared files in large work spaces — are said to provide capabilities similar to IBM's APLSV and VS/APL.

Features include the implementation of all APL operators, system variables, system commands, I Beam functions and system functions. Files created by other language processors like Fortran, Cobol, RPG, Basic, PL/I and Pascal may be read from APL/LWSF using the sequential file access functions. APL may also create files designed to be processed by non-APL languages.

The APL/LW version costs $8,900 and the APL/LWSF version costs $11,500.

Mips Software is located at Suite 202, 1899 Orchard Lake Road, Pontiac, Mich. 48053.


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## Cincom Updates Series 80 LMS-II

CINCINNATI — Cincom Systems, Inc. has enhanced its Series 80 LMS-II development operations control package to offer IBM OS and DOE users what it said are better system editing capabilities for source programs and improved operating system queue display and system control facilities.

Series 80 LMS-II now contains TOP and BOTTOM commands to allow quicker editing of data members, the firm said.

New capabilities include enhanced forward and backward paging and additional DOS or DOS/VSE features including multipartition job submission.

The enhancements are offered to current LMS-II users at no extra charge. The package costs $17,500 in an OS environment and $15,500 in a DOS environment, the vendor said from 2300 Montana Ave., Cincinnati, Ohio 45211.

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## Performance, Integrity Reporting
# DBMS Offers IDMS Analyzer

LOMBARD, Ill. — The Systems Division of DBMS, Inc. has released a software analyzing system that is said to provide extensive performance and integrity reports from the archive journals produced by Cullinane Corp.'s IDMS data base management system.

The IDMS Journal Analyzer system is compatible with Release 5.0 and 5.5 of IDMS and its related operating system. Designed to supply information needed to manage the IDMS environment, the analyzer software delivers data concerning program volatility, resource contention, tuning and integrity in an understandable format and at a level of detail controlled by the user, a spokesman said.

The information provided by the software allows verification of new programs and the detection of problem areas such as ineffective programming techniques, data base corruption and improper generation of the central version. A user manual is supplied with the software which allows the user to interpret and apply reported information to the data base environment, the spokesman explained.

The software costs $7,500 plus a 10% yearly license renewal fee. Copies of the user documentation as well as a 30-day free trial are available.

DBMS can be reached at 33 W. Roosevelt Road, Lombard, Ill. 60148.

## Training Courses Set

LOMBARD, Ill. — DBMS, Inc., a firm specializing in data base and data communications, is offering a series of software training courses in various locations throughout the country.

Scheduled to begin Sept. 5 in San Francisco and run through mid-February, the courses will spotlight data base technology and Cullinane Corp.'s Culprit report generation package and IDMS data base management system.

The courses generally run a few days and are aimed at experienced programmers, systems designers and programming supervisors. However, anyone with a basic understanding of computers and programming can benefit from the subject matter, a spokesman noted.

Course topics include "Comprehensive IDMS," "Comprehensive Culprit," "Data Base Design With IDMS," "Application Programming With IDMS" and "Integrated Dictionary for IDMS."

A three-day session on "Data Administration for IDMS" will offer the guidelines required to manage a contemporary data base environment, the spokesman explained.

The courses will be held in Stamford, Conn., San Francisco, Chicago and Oak Brook, Ill., and cost from $375 to $495.

In addition, the fifth person enrolling from the same organization can attend the course free of charge.

For those corporations unable to attend classes in the designated cities, DBMS will for a fee send an instructor to set up and arrange a class at the nearest hotel or convention center. The special package programs are priced at $1,300 per day for up to 10 students to $1,675 per day for up to 25 students, plus instructor expenses.

Details on the firm's course offerings and education packages can be obtained from the company's Productivity Division, 33 W. Roosevelt Road, Lombard, Ill. 60148.

# Legal Side of Acquisitions Briefed

*(Continued from Page 41)*

manager's advantage to gain familiarity with how four particular areas of law are involved in acquiring applications software, Lavey said. Those areas include the following:

- Proprietary rights in information (trade secrets, copyrights, patents and trademarks).
- Contractual restrictions on resale and use (antitrust considerations).
- Liability for representations (express warranties, warranties implied by the Uniform Commercial Code and the tort law of fraud).
- State sales taxes related to the transaction.

### Trade Secrets

The most common method of attempting to secure legal protection for applications software involves the law of trade secrets, Lavey said. This protects the software developer against disclosures or uses of his information when such actions constitute a breach of confidence.

Software vendors often claim these protections for their products, but don't bother to enforce them because of technological and market changes. "However, an increase in trade secrets litigation" is a reasonable expectation, according to Lavey.

Current antitrust laws cause the "prudent [software] developer to refrain from selling and passing title to his package," Lavey explained. Therefore, the transaction between the developer and the acquirer (rather than buyer) may take the form of a restricted license.

"Careful drafting of the contractual provisions [regarding restrictions on resale and use] is necessary," the attorney cautioned, because "the distinction between a license and a sale is not well-defined in the law."

The acquirer of the software package will naturally want some legal recourse against the developer for unsatisfactory performance, and this is provided for via expressed written or verbal contractual provisions, Lavey said.

Finally, the "body of law dealing with the taxation of such transactions [acquiring an applications software package] has grown," he pointed out.

# Inventory/Financial System Fits Honeywell Level 6

TEMPE, Ariz. — An on-line Inventory/Financial Management System for the Honeywell, Inc. Level 6 is being offered by Independent Computer Systems (ICS).

The system includes inventory, accounts payable, accounts receivable, order entry, purchasing, payroll and general ledger.

It features total integration of all systems, secured access through variable menus based upon operator/password codes and transaction logging capability, fast implementation due to flexible system parameterization, on-line and interactive feedback, a maximum of 10K words per terminal memory and full support, the vendor said.

A basic system costs $25,000 from ICS at 1201 E. Knight Lane, Tempe, Ariz. 85284.

## Correction

Duquesne Systems, Inc.'s QCM [CW, Aug. 4] has always been available for MVS. Version III, however, offers support for VM/MVS.

# A big week for small computer specialists

The sixth Minicomputer/Microcomputer Conference and Exposition will be held in Brooks Hall and San Francisco Civic Auditorium, October 14-16.

Everything that's new and significant about small computers and systems will be on display on Mini/Micro's show floor and reviewed by experts in the Civic's four spacious auditoriums.

And there are some important extras! The Association of Computer Programmers and Analysts will hold its 10th anniversary conference just preceding Mini/Micro (call (800) 556-6882 for full details) and U.S.U.S. (the UCSD system users' society) will meet for three days during and following Mini/Micro. There will also be a day-long, Introduction to Pascal seminar.

Mini/Micro's professional program, previewed below, offers 60 hours of up-to-the-minute information in 24 half-day sessions.

Mark your calendar now, and use the coupon to request the Mini/Micro detailed preview program, available September 1.

TUESDAY, OCTOBER 14, 9:30 AM

1. The Small Business Computer in the Next Five Years
*S. Henry Socks, Mini/Micro Systems*

2. Pascal Applications in the Minicomputer Environment
*A. Winsor Brown, Point 4 Data Corp.*

3. Professional Programmers/Analysts' Role with Small Computers
*John Prior, Consultant*

4. Impact of New Technologies on Marketing Opportunities for OEMs
*Richard Able, Christman/Able Advertising*

TUESDAY, OCTOBER 14, 1:30 PM

5. Quality Assurance for Small Computer Software
*Murray Zuckerman, Consultant*

6. Are Programmers Really Necessary?
*Richard Dalton, Open Systems*

7. Microcomputers in Banking
*Robert Reffelt, Chase Manhattan Bank*

8. Data Communications for Minicomputer Users
*Roger Evans, Micom Systems*

WEDNESDAY, OCTOBER 15, 9:30 AM

9. Pascal Open Forum: Implementation Interfacing to Existing Systems
*A. Winsor Brown, Point 4 Data Corp.*

10. Design Objectives for Color-Graphics Desktop Computing Systems
*Ed Bride, Hewlett-Packard (DCD)*

11. Winchester Disk and the Backup Issue: What's Happening?
*Larry Hemmerich, Cipher Data Products*

12. Effects of Microcomputers on Marketing *Jim Jordan, Moxon Electronics*

WEDNESDAY, OCTOBER 15, 1:30 PM

13. IBM Watching: New Directions for Small Computers
*John Rehfeld, International Data Corp.*

14. Software Evaluation and Selection
*Bill Fisher, Arthur Young & Co.*

15. Session title and organizer to be announced.

16. Current trends in Computer Graphics
*Dr. John Moreland, Megatek Corp.*

THURSDAY, OCTOBER 16, 9:30 AM

17. Latest Armament in the Winchester Revolution
*Randy Knapp, Wespercorp*

18. Data Base Capabilities in Small Computers
*Susan Kolb, Hewlett-Packard (DCD)*

19. Computer Security in the Mini/Micro Environment
*Bill Fisher, Arthur Young & Co.*

20. Information Processing and Reporting: State of the Art in the "Paperless Society"
*Mike Helft, Arthur Young & Co.*

THURSDAY, OCTOBER 16, 1:30 PM

21. Distribution Alternatives for Small Business Computers
*Robert R. Mueller, Office Products Dealer Magazine*

22. Increasing Market Potential for Minicomputer Distribution
*Bill McNamara, Systel Corp.*

23. Systems in Hospitals and Health Care
*Neil D. Kelley, Infosystems Magazine*

24. Session title and organizer to be announced

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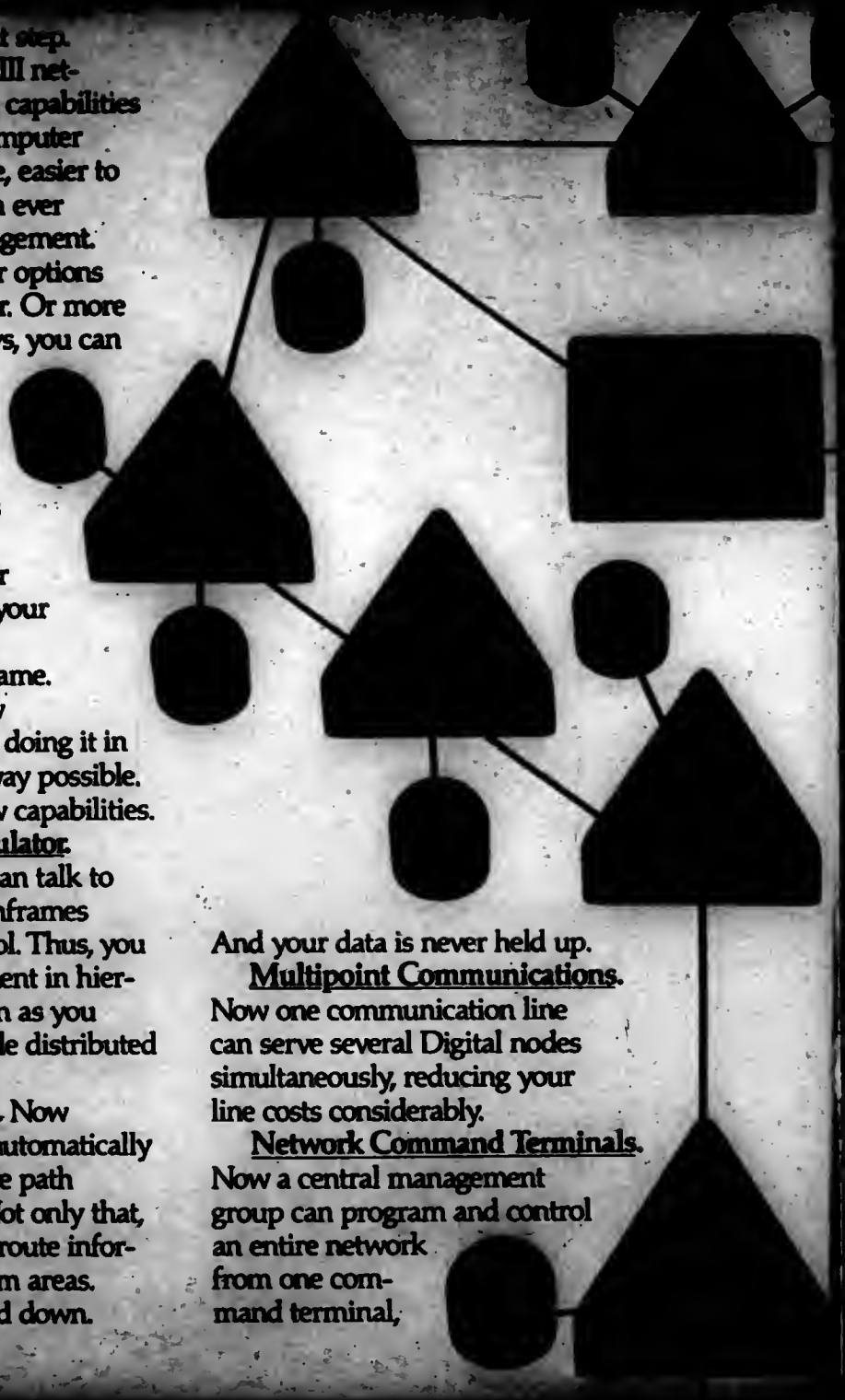

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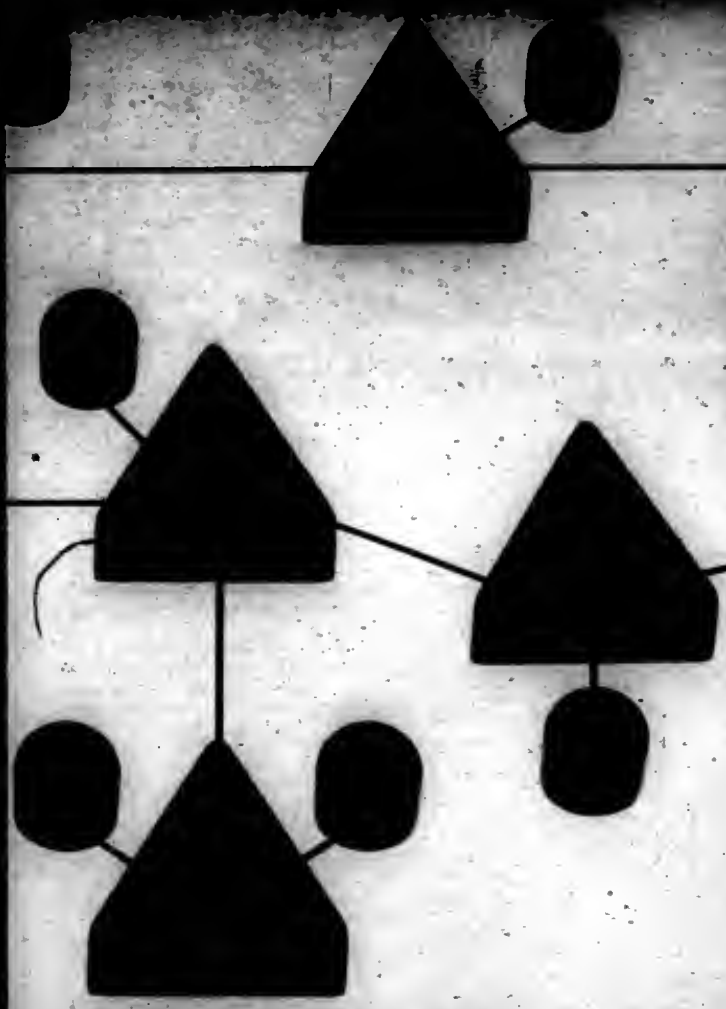

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*Tests and Distributions*

# Tektronix Adds Statistical Programs

BEAVERTON, Ore. — Tektronix, Inc. has announced a line of statistical test and distribution programs for its 4050 series of graphics computing systems.

The Plot-50 Tests and Distributions package is a collection of 18 general purpose statistical routines, 17 special-purpose function keys and 13 data management facilities, the vendor said.

The package was designed to support the 4050 in engineering design, statistical research and management reporting applications.

The function keys are said to allow easy program operation for novices, and the programs reportedly generate high-quality plots including cumulative and suspended histograms, stem and leaf displays and box whiskers plots to represent and explore data, the vendor said.

The package also includes programs for probability plots and distribution analysis, contingency tables, random number generators and probability distribution tables, the firm said.

Plot 50 Tests and Distributions is a disk-based package and is supported by the firm's 4907 file manager.

The package costs $600 from the vendor at Marketing Communications Department, Tektronix, Inc. P.O. Box 500, Beaverton, Ore. 97077.

# Burroughs CMS Gets Receivables

SOUTHFIELD, Mich. — Logical Design Corp. is offering an interactive, multicompany accounts receivable package for Burroughs Corp.'s CMS family of mainframes.

The open-item system maintains debit, credit and adjustment information for each customer account and provides aged detail and aged summary trial balances for up to 90 days.

The package is written in Ansi 74 Cobol and costs $3,000 from Logical at Suite 330, 27777 Franklin Road, Southfield, Mich. 48034.

# Tool Provides Security, Audits

CHICAGO — RES-Q, a systems quality assurance methodology which can reportedly be implemented as an automatic generator of statement-by-statement audit trails for every change made to a source program, is being introduced by Quality Systems.

RES-Q, which also can be used as a recovery tool, produces audit information from a current source member and any appropriate backup. RES-Q features a source-comparison algorithm that enables RES-Q to perform its task with no dependence upon sequence numbers in either the base or the updated copy of the program.

RES-Q reportedly is not affected if the source has been left in its original numbering format, renumbered or even unnumbered. It also can be used on any source format — Assembler, Cobol, Fortran, RPG and others — and works with any source manager and any on-line system, according to the vendor.

RES-Q can be used during the production transfer process and is available for $2,500, including two years' maintenance and support from Quality Systems at Suite 1621, 919 N. Michigan Ave., Chicago, Ill. 60611.

# Series/1 Handles Subscriptions

WAKEFIELD, Mass. — An in-house circulation and subscription management system that runs on the IBM Series/1 minicomputer has been introduced by Wakefield Software Systems, Inc.

Andi is capable of handling more than 200,000 subscribers, according to the vendor. It runs under the EDX operating system and uses IBM 4978 CRT terminals, which are menu-driven with a prompting capability for operation by in-house personnel.

Hardware costs from IBM range from $35,000 to $60,000 depending on the number of subscribers and growth potential. Andi licenses for $14,500 including installation and training.

Wakefield Software Systems is located at 28D Vernon St., Wakefield, Mass. 01880.


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But there's more to the Memorex 1270 Model 8 Terminal Control Unit than reliability, flexibility, availability and cost effectiveness.* The specifications tell the whole story. For complete information about the Model 8, other 1270s and the entire Memorex family of display terminals and printers, contact Nancy DeKraker at (408) 996-9000 or write to Memorex Communications, 18922 Forge Drive, Cupertino, CA 95014.

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*The 1270 Model 8 is available in the Continental U.S. only. © 1980 Memorex Corporation. Memorex is a registered trademark of Memorex Corporation.

# Word Processing Aid Runs With PDP-11s, LSI-11s

IRVINE, Calif. — The PWS-1 Word Processing/List Processing Software System for Digital Equipment Corp.'s PDP-11 minicomputer and LSI-11 microcomputer has been introduced by Plessey Peripheral Systems.

Formatting commands determine spacing, margins, page length, tabulation and other characteristics, and copy format can be changed as often as necessary, either as copy is being entered or after entry is completed, the firm said.

Using the list processing feature, the software can reportedly sort and merge a list of names and addresses into the appropriate business letter for individualized correspondence.

PWS-1 is written in Macro-11 assembler language and is used in conjunction with the RT-11 operating system, with or without TSX time-share facilities. All insertions and deletions are cursor addressed, and 21 lines of text are displayed at all times. Password security is also provided.

Ascii source files are used by the system for easy interface with existing applications and for support for DEC-supplied utilities, Plessey said.

PWS-1 comes with a choice of media and includes program binaries, documentation and license to use, with optional training and support. It costs $2,300 from Plessey at 17466 Daimler Ave., Irvine, Calif. 92714.


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# 'Scribe' Backs Eclipse Users

CAMBRIDGE, Mass. — A software package that gives word processing capabilities to users of in-house time-sharing systems based on the Data General Corp. Eclipse under AOS has been announced by Intermetrics, Inc.

Claimed to be comparable to $5,000 to $6,000 word processing systems, but costing only $2,000, the Scribe system generates tables of contents, footnotes and indexes. It offers full use of the printing capabilities of the Diablo 1620, the firm said.

Intermetrics is located at 701 Concord Ave., Cambridge, Mass. 02138.

# Updated 'Ihis' Targets Up to 600-Bed Hospitals

DAYTON, Ohio — NCR Corp. is offering an updated version of its Interactive Healthcare Information System (Ihis) that reportedly provides speed and capacity for larger users.

The new version will operate under the Interactive Resource Executive (IRX) operating system on NCR I-8400 series systems. Previously, the largest system that could be used was the minicomputer-based I-8270. This upgrade enables the system to handle 600-bed hospitals, up from a maximum of 200-bed facilities, NCR noted.

Performance should also improve by an average of 50% for applications used on the I-8430 under the IRX compared with timings on an I-8250 under the Interactive Multiprogramming Operative System (Imos), NCR claimed.

Ihis is a series of more than 100 programs covering all hospital business information, and as a multiprogramming system, it can process several applications at one time, the vendor said.

The minimum configuration for the new Ihis version, which is written in Cobol, includes an I-8400 processor with 512K bytes of memory, a printer, a CRT and 54M bytes of disk capacity.

The software is available through payment of either a one-time license fee or a monthly license fee. Major software modules and their license fees include the following: Inpatient Processing: one-time fee of $3,360 or monthly fee of $80; Outpatient/Clinic Processing: one-time fee of $2,750 or monthly fee of $66; Patient Accounts Receivable (without detail): one-time fee of $3,360 or monthly fee of $80; Insurance Proration Extension: one-time fee of $530 or monthly fee of $12.

# Package Helps HP Users Control Manufacturing

IRVINE, Calif. — MAC-PAC/HP, a discrete manufacturing control software package for Hewlett-Packard Co. 3000 computers that consists of integrated linkable software modules, each performing specific functions within a complete manufacturing control system, is being offered by Far-West Data Systems, Inc.

Jointly developed and owned by Far-West and Arthur Anderson & Co., MAC-PAC/HP will provide improvement in productivity and performance to due date and increase factory output response by reducing production bottlenecks, the firm stated.

A basic system consists of a design engineering module, an inventory control module, a material requirements planning module and an on-line communications module. The system can also be expanded with eight additional modules at any time, according to Far-West.

The task-driven system operates in both on-line and batch modes, makes use of HP's Image data base manager and is written in Cobol. Price for a single CPU license for the basic system is $49,000 plus implementation support from the firm at 17841 Fitch, Irvine, Calif. 92714.

# 'Docuscan' Searches Legal Documents

WHITE PLAINS, N.Y. — Vista Computer, Inc. is offering a software package that will search and retrieve legal documents.

Written in an advanced proprietary version of Mumps, Docuscan is menu-driven and does not require special commands or syntax, the vendor said.

The package can search for individual words, word lists, a choice of word lists or word pairs.

Docuscan costs $2,500 from the vendor at 709 Westchester Ave., White Plains, N.Y. 10604.

# 'Pfas' Supports Pascal Coding

CARDIFF, Calif. — C.J. Wigglesworth Software has announced a package that reportedly can run on LS or II.0 UCSD Pascal systems.

Pfas allows a programmer to write programs that access data with user-defined keys. It uses a B+ tree file organization, ensuring that the time required to find any information in the file does not change with the number of records in the file, the vendor said.

The standard version of the package, using less than 6K bytes of memory, can reportedly make a new file, open an existing file, add records to a file randomly or sequentially by key, start reading sequentially with any record and change records already in the file.

The extended Pfas package includes all features in the standard version, besides the ability to provide real-time record and key deletion and retrieval of records by partial key.

Both versions are available in machine-readable form on an 8-in. soft-sectored, single- or double-density floppy disk. A user manual is included.

Single-site license fees are $100 for Standard Pfas, $150 for Extended Pfas, $175 for both and $10 for documentation. The firm can be reached at P.O. Box 755, Cardiff, Calif. 92007.

# The Zenith Smart Terminal.

## Compare the features.

Reverse video by character can be used to emphasize words, lines, phrases or paragraphs.

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Z80 Microprocessor-control brings easy editing, cursor flexibility and reverse video highlighting to your on-line system.

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Cursor and special functions are accessible by keyboard or outside computer.

80 character by 24 line format, plus a 25th line for operator messages and prompts.

Prints complete ASCII character set including upper case, lower case with descenders and special graphic symbols.

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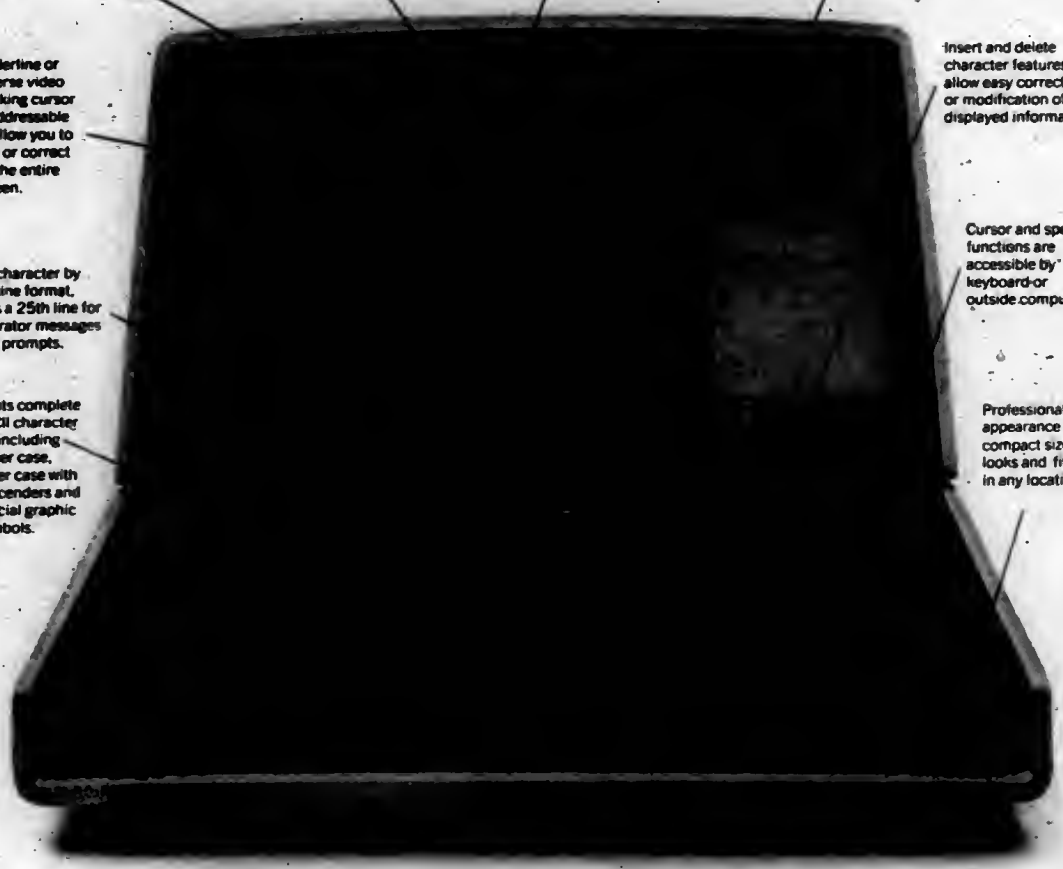

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For under $1000,* the Zenith Z19 smart terminal is a very smart buy. It can be utilized with almost all commonly available computer systems and provides the most advantageous features for data entry, editing, inquiry, and transaction processing—wherever you need a top-of-the-line, general-purpose terminal.

The Z19 is ideal for high speed data entry. The 12" diagonal CRT gives you a crisp, clear video image. And the Z19's keyboard follows the standard typewriter keyboard layout for operator ease. Along with this you get ANSI and DEC®-VT52 compatibility. And one other important plus: Quality you can depend on, because it's Zenith.

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## HP 3000 Users Offered Report Generator

OAKLAND, Calif. — A report generator program and language for the Hewlett-Packard Co. 3000 CPU series has been unveiled by Gentry, Inc.

REX/3000 was designed to facilitate application systems development.

It performs housekeeping functions such as opening and closing data bases and files or testing for end-of-file conditions.

REX/3000 is said to enhance the use of both Image and MPE files by allowing the user to access any combination of data bases, data sets and files during report preparation and also produce multiple reports on a single pass through the data.

These features were not available with HP's interpretive Query language, Gentry claimed.

The single-unit price is $8,500 and the annual maintenance/enhancement plan costs an additional $850.

Gentry is located at 430 40th St., Oakland, Calif. 94609.

## Packages From Morton Support Series/1 Users

SAN ANTONIO, Texas — Morton Data Systems, Inc. is offering a line of software packages for IBM Series/1 systems that support inventory control, general ledger, payroll, accounts payable and accounts receivable.

The packages cost $2,500 each or $12,500 for all five.

In addition, the firm is offering a spooling system for the Series/1. That package will be available in September, the vendor said.

Users of the Morton packages do not have to have OCL or JCL knowledge to operate the software, a spokesman claimed.

The software offers automatic file backup procedures, security code systems, ongoing software support and maintenance, customer software design and programming and no-charge enhancements.

The software also lets the user change variables.

Morton is located at Suite 302, 1222 N. Main Ave., San Antonio, Texas 78212.


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## CPM Program Written in Fortran

BERKELEY, Calif. — Technical Economics, Inc. has unveiled Critical Path Method (CPM), an interactive project management program that produces graphic diagrams from a line printer or terminal and runs on small, medium and large computers.

The system was written in Fortran and tracks multitask projects of up to 3,000 activities and generates 12 reports, the vendor claimed.

CPM's Precedence Network Printer, a diagram displaying the sequence of tasks governing the entire project, can reportedly be printed on a line printer or any 32-column terminal.

The product runs on Digital Equipment Corp. Decsystem-10, Decsystem-20 and PDP-11 and Honeywell, Inc. 66 computers. Conversion to the IBM System/34, Honeywell Level 6, Prime Computer, Inc. CPUs and the Data General Corp. Eclipse is currently in progress.

CPM's purchase price is $10,500. Technical Economics can be reached at P.O. Box 7261, Berkeley, Calif. 94707.

## Course Set On JSP

CINCINNATI — A course focusing on the Jackson Structured Programming (JSP) method, which is based on an analysis of data structures and a matching of those structures with the data being processed, will be offered Sept. 8-12 by MBA Technical Institute here.

The JSP design method was developed in London by Michael Jackson and differs from most functional programming approaches.

The structure imposed on the user's data reflects the user's view of the meaning of that data, a spokesman explained.

This is the original JSP course and will be conducted personally by Jackson and his staff. The cost of the seminar is $800 per person.

Registration information can be obtained from MBA Technical Institute, 1248 Springfield Pike, Cincinnati, Ohio 45215.

## I.P. Sharp Network Gains Oil Statistics Report

TORONTO — I.P. Sharp Associates has added a quarterly oil statistics report from the Organization for Economic Cooperation and Development (OECD) to its international computer network.

The report covers production, refinery output, stocks, exports (split by destination country), imports (split by country of origin), international marine bunkers and delivery information.

The report is billed on an as-used basis, the firm said from 145 King St., Toronto, Ont. M5H 1J6, Canada.

## RCC Adds Finance Reports

PALO ALTO, Calif. — Remote Computing Corp. (RCC) has announced a series of standard reports available to users of the SLP financial planning system.

Designed to meet the reporting requirements of the Federal Home Loan Bank Board, the seven reports are highlights; statement of condition; income statement; cash flow detail; savings analysis; assets and liabilities as a percent of total assets; and income and expenses as a percent of average assets.

RCC is headquartered at 1076 E. Meadow Circle, Palo Alto, Calif. 94303.

## Systems Research Makes Changes

MONROEVILLE, Pa. — Three major changes to the licensing fee structure for RIMS/MPG (Requester-Oriented Information Management System Mechanized Program Generator), a program/report generator offered by Information and Systems Research, Inc., have been announced.

Effective Sept. 30, the vendor will raise the basic license fee for all OEM and distributor versions of the product by 50%, it said.

Secondly, all sliding-scale discount schedules for OEMs and distributors will be discontinued. After Sept. 30, the only royalty fee will be "pegged" at one-third of the then-prevailing end-user license fee for the full RIMS/-MPG product.

Finally, the vendor announced the addition of a report generator-only version of RIMS/MPG entitled CO-OP (Customer Oriented-Output Producer). This version will be identical to the standard RIMS/MPG product, but without the SCREENS and MERGE capabilities, a spokesman said.

Information and Systems Research is located at the Jonnet Bldg., Monroeville, Pa. 15146.


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# Now you can watch your four favorite programs...

The new HP 2626 display station will give you a view of your computer system you've never seen before.

It lets you divide the screen into as many as four separate "frames," each attached to a different workspace in the terminal's memory. You can check a program listing in one frame and access a file in another. Fill out a form in one workspace while the computer loads the next form into another. Or do text preparation and editing in adjacent frames. Right before your eyes.

That's not all. The HP 2626 has two data communications ports instead of the usual one, so you can use the split screen capability to talk to two computers at the same time. Or log onto the same computer twice for simultaneous batch and interactive jobs.

## More than meets the eye.

A high resolution character cell and a glare-reducing screen coating give the HP 2626 the sharpest, clearest display of any of our terminals. And that's saying a lot.

What's more, you can set line lengths of up to 160 characters in any workspace. Then scroll horizontally to get the entire picture. (The built-in thermal printer includes a compressed mode to print up to 132 characters per line.) Scroll vertically, too, or change the size of the frame at the touch of a key.

An interactive forms drawing module makes it easy to design forms, including drawing horizontal or vertical lines with just a single keystroke. You can even program the terminal for audio tones to cue your operator to critical or non-critical errors, or other conditions within a program.

## Split decisions.

Hook up the HP 2626 to two computers (or the same one twice) and it's like getting a multi-tasking capability right in the terminal. Your systems designer can now compile, execute, monitor and edit programs as if two stations were available.

While your user is filling out a form, the terminal can be sending data from the previous form to a computer. And down-loading the next form into an adjacent workspace. By smoothing out the "type and wait" of data entry, you can take advantage of less expensive, low-speed transmission lines without sacrificing the efficiency of your operator. The result? You'll get more out of the entire system.

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If you'd like to watch a program on the new HP 2626 display station, or any of our terminals, just call your local HP sales office listed in the White Pages. You can also write for more information to Hewlett-Packard, Attn: Ed Hayes, Dept. 371, 19400 Homestead Road, Cupertino CA 94015. Or just return the coupon.

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## Datapoint Gear Gains 'Grip'

WESTMINSTER, Calif. — Multiple Data Services Corp. has unveiled a report generator for all Datapoint Corp. processors that supports either sequential or Isam index files.

Known as Grip, the product is suitable for one-time special report requirements, short notice requirements, ad hoc report generation by a terminal user, routine reports where extensive or specialized logic and/or formatting are not required and test or experimental situations, the vendor claimed.

Grip is priced at $495, the vendor said from 13812 Goldenwest St., Westminster, Calif. 92683.

## System/32, 34 Get Exploder

LANSING, Mich. — A software package for the IBM System/32 and System/34 that is said to generate an exploded procedure listing with indentation of nested procedures has been introduced by Davidson Software Systems.

The Procedure Exploder Utility prompts the user for the appropriate user library, allowing the user to enter procedure names which are scanned for nested procedure calls, such as Evoke, Include and JobQ statements.

The utility is being offered for a one-time lease charge of $300, which includes all RPG-II programming, documentation and procedures.

Davidson can be reached at P.O. Box 21002, Lansing, Mich. 48909.

## OS/MVS Training Slated

NEW YORK — Software Education Corp. will hold several September training sessions here for programmers working in OS/MVS shops.

The sessions combine lectures with laboratory training. Courses include "Advanced Vsam," offered Sept. 2-9 and costing $425; "Vsam for Assembler/Cobol Programmers," Sept. 9-19, $475; and "Entry-Level Programmer Training," Sept. 29-Dec. 19, $3,750.

Software Education is in the Grace Building, 37th Floor, 1114 Ave. of the Americas, New York, N.Y. 10036.

## 'Selector IV' Manages Dedicated, Integrated Tasks

SAN RAMON, Calif. — Selector IV, a self-contained applications implementor providing data, procedural, query and report definition functions, has been released by Micro-Ap, Inc.

The product is primarily geared toward managing dedicated, integrated applications. No language code is required with it and procedures are defined as named definitions and can be executed as needed, the vendor claimed.

Selector IV can process records from several different files at the same time, and information can be freely moved from one file to another. The product is both hard disk- and soft disk-oriented and will manage as many records as the operating system can handle, a spokesman said.

It also allows dates to be formatted according to any country's convention and has provisions for geneological processing of dates.

The price is $550, the vendor said from 9807 Davona Drive, San Ramon, Calif. 94583.

## 'Specs' Backs Packaging Work

DALLAS — Compucon, Inc. has released a packaging specification package, Specs, a minicomputer-driven system for packaging engineers and departments working with Digital Equipment Corp. PDP-11s.

The package features English-like searching of its Package Component Data Base, specific sheet generation and extensive cross-referencing, the vendor said.

The package will be available in September and will cost $25,000 from Compucon at 13749 Neutron Road, Dallas, Texas 75240.

Bobby Harper, Manager of Information Services, Vought Corporation

# Vought Corporation makes planning fly with IFPS.

Vought Corporation, aerospace subsidiary of The LTV Corporation, is a half-billion dollar company which builds military aircraft, missiles and space systems and commercial aircraft components.

Bobby Harper, Vought's Manager of Information Services, recently discussed their use of EXECUCOM's Interactive Financial Planning System (IFPS).

"IFPS was chosen by Vought Corporation in 1976 as our first venture into the area of Decision Support Systems. Comparative studies of products existing at that time proved IFPS to be the only one with a current set of superior capabilities plus unlimited expansion possibilities," he said.

"IFPS has proven itself in direct support of management by providing timely response to management questions that otherwise would have remained unanswered in the time frame allowed. Applications have been most prominent in the financial areas. However, many significant uses are found in manufacturing, materials, and engineering," he noted.

Uses at Vought include debt planning, debt management, treasury operations, consolidation of balance sheet and income statements, transportation, facilities, and engineering planning and forecasting.

He continued, "Answers to critical questions that once were not available may now be researched in a reasonable time. Analysis of data that required production programs and unacceptable lead time to compose routines may now be obtained in time for decision-making department heads to use it."

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*Planned for State Liquor Stores*

# POS Units May Save Ohio $43 Million

Special to CW

COLUMBUS, Ohio — Data collection for Ohio's 300 state-run liquor stores is being automated by point-of-sale (POS) terminals that may save the Department of Liquor Control (DLC) here about $43 million in 10 years.

That savings estimate comes from a DLC feasibility study on the plan to put two or three POS terminals in each state-operated outlet, typically replacing 100-key electromechanical adding machines whose 15-year-old optical print heads have worn out. Ohio runs the stores to acquire money without raising taxes; last year, they reportedly put $130 million in the state's General Revenue Fund.

By the end of 1981, the DLC hopes to implement a front-end processor at its computer center here to receive on-line communications via a common carrier from the NCR Corp. 2140-3002 terminals in each liquor store. This would increase the stores' rate of inventory turnover, the feasibility study predicted, from about 2.7 to eight turnovers per year, adding $23.8 million to the Buckeye state's coffers.

### Warehouse System

As part of the automation program, the DLC has already implemented a Warehouse Access Communications System (Wacs) which allows its 1M-byte IBM 370/148 mainframe in Columbus to communicate via common carrier with each of five liquor warehouses. Wacs optimizes the warehouses' support of the liquor stores by giving the DLC up-to-date information on inventory status and customer demand for particular items, according to Ervin J. Erlanger, a DLC administrative assistant.

After an expenditure of about $13.1 million on buying and maintaining the store POS terminals, the expected $43 million gain in revenues would yield a net cost benefit to Ohio of some $30 million by 1990. Besides the savings resulting from an increased rate of inventory turnover, the DLC looks forward to saving another $16.7 million in the 1980s by eliminating manual procedures for coding merchandise and sales reporting.

And another $1.9 million will be saved if the NCR terminals speed up the DLC's process of depositing revenues in Ohio's Treasury to the extent anticipated. However, inflation could significantly erode these 10-year estimates, which are based on 1978 dollars, Erlanger pointed out.

For the typical Ohio imbiber, the terminals will mean less time at the checkout stand. The "average purchase" of 1.3 bottles will be negotiated in 26 seconds, Erlanger said, a 45% improvement from 47 seconds.

Eventually, one terminal in each liquor store will serve as a "master terminal" with the attachment of a 96K-byte memory board and a tape cassette recorder. The recorders will capture data from transactions at all the store's cash registers.

Cassettes of this information will be mailed to the DLC in Columbus for preprocessing on an NCR 7530 minicomputer. Next, full-size magnetic tapes of the sales data will be transferred from the mini to the DLC's main computer system.

By adding a memory board to each store's master terminal, the DLC will avert a need to have price data regularly keyed into the store's other terminals. Instead, a salesclerk will enter a five-digit code designating brand and size (fluid volume) of each bottle being purchased, inducing the master terminal to verify that the code corresponds to stock on hand and to return the item's price.

For multiple purchases of the same item, the clerks key in the quantity and the terminals return the total pricing. The master terminal capabilities will also expedite the stores' adjustment to price changes set by distillers.

*With 10M-Byte Drive, Color CRT*

# Single-Operator Net Monitor Debuts

MIAMI — Racal-Milgo, Inc. has introduced a single-operator diagnostic and management system for medium-scale networks that features a 10M-byte hard disk drive and a color CRT.

The CMS 1000 is based on the firm's previously introduced multioperator CMS 2000 system and offers network users complete monitoring and test generating capabilities, a spokesman said. The system allows a single user to direct automated monitoring, testing, control, restoration and configuration on up to 32 user lines.

### Four-Function System

The four-function system displays priority and test results on a color CRT and uses a color-keyed menu approach to facilitate user understanding and responses.

In addition, the system's disk unit retains significant information about modems and other devices, their physical location in a network and their relationship to each other.

CMS 1000 prices start at $39,500, including the color terminal and a logging printer. First deliveries are scheduled for October.

Racal-Milgo is located at 8600 N.W. 41st St., Miami, Fla. 33166.

Racal-Milgo's CMS 1000

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1200/300 Baud Full Duplex
Direct Connect - No DAA
Each Modem Provides:
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• Manual Originate
• 6 Status Indicators
• Analog Loopback
• Digital Loopback
• 300 or 1200 Baud

☐ SERIES 330
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Leased Line

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• Display of 6 Functions
• Busy Out
• Loopback

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$837 Modem Stand-alone
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$137 Modem Leased Line
$147 2 Modem Unit
$297 8 Modem Unit
$497 16 Modem Unit

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"We've developed an online order entry system with one-third the effort... and the application is much more polished. We're very pleased."—Larry Brenner, Director, Corporate Information Services, United Merchants and Manufacturers, New York City.

"The System/38 significantly reduced the amount of code necessary to write a program and the time and effort required to move into new applications. We're extremely enthusiastic."—Larry Petterson, Director of Data Processing, St. Olaf College, Northfield, Minnesota.

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For more information call your IBM General Systems Division representative or write us at P.O. Box 2068, Atlanta, GA 30301.

IBM

General Systems Division

# NCR 279, IBM 3270 Linked to System/34

BOULDER, Colo. — A financal data system interface that uses an IBM Series/1 computer and proprietary software to connect NCR Corp. 279 teller machines, CRT keystations and IBM 3270-like CRT terminals to an IBM System/34 minicomputer has been announced by Systems Design & Development Corp. (SDD). The system is used for on-line banking applications.

The 4751 interface was designed for main and branch banks for communication with a System/34 to verify account numbers and account balance information and to post transactions to customer accounts. The connection between the IBM minicomputer and the financial data system interface is a standard System/34 point-to-point communications protocol, a spokesman stated.

The System/34 attachment is an extension of the firm's 3751 financial data system currently in operation in banks throughout the country. The 3751 is geared for IBM System/3 and 370 machines. SDD 4751 hardware maintenance is provided by IBM, the spokesman added.

The 4751 interface costs $10,000 from SDD at 2355 Canyon Blvd., Boulder, Colo. 80302.

# Smarts Box Bows to Make Dumb Terminals Intelligent

HAUPPAUGE, N.Y. — North Atlantic Industries, Inc. has introduced a self-contained Smarts Box to provide intelligence for nonintelligent terminals.

In addition to a Digital Equipment Corp. LSI/11-2 microprocessor board, other logic cards include two independent RS-232C interfaces, 8K bytes of random-access memory (optionally expandable to 32K bytes), space for 8K bytes of read-only memory, a 60-Hz crystal clock and two vacant Q-bus compatible card slots to accommodate more specialized user dedication cards.

The product can be used to link remote terminals to a host computer, as well as upgrade terminal performance, the vendor claimed. The unit was designed for ease of hard-wired connection to users' terminals and also printers, tape transports and other peripherals.

The Smarts Box

The single unit price is $2,560, the vendor said from 60 Plant Ave., Hauppauge, N.Y. 11787.

# PABX Systems Get Channel

KIRKLAND, Wash. — Teltone Corp.'s Data Carrier System (DCS-2B) uses high-frequency carrier techniques to add a high-speed data channel to an existing PABX telephone pair. The derived, point-to-point link is capable of 9,600 bit/sec, full-duplex asynchronous operation without distributing normal telephone service, the vendor said.

The system is said to allow data communications managers to respond faster to requests for service because it eliminates the need for RS-232C cable, additional twisted pair and limited-distance modems.

The basic components of the DCS-2B are the M-821 station unit and the M-831 channel termination card. The station unit interfaces a terminal and connects in series between the telephone and a single pair loop.

At the PABX equipment room or distribution frame closet, the channel termination card connects in series with the telephone pair to separate the physical voice loop from the derived carrier.

The M-821 station unit costs $257 and the M-831 channel termination card costs $246, the spokesman said from Teltone, 10801 120 Ave. N.E., Kirland, Wash. 98033.

# Records Management Geared to WP Systems

NEW YORK — Bowne Information Systems, a division of Bowne & Co., Inc., is offering a records management system that is said to be compatible with most communicating word processing (WP) systems.

By adding the package via a telephone link with the vendor, the user gains automatic records capture as a by-product of typing, records security and a central data reference center, Bowne said.

The package is billed on an as-used basis, the time-sharing vendor said from 160 Water St., New York, N.Y. 10038.

# DURABLE

Wh[illegible]
computer tap[illegible]

Like its predecessor, [illegible]
But Epoch 480 also uses [illegible]
— the Magnum 50 [illegible] It's [illegible]
conventional particles.

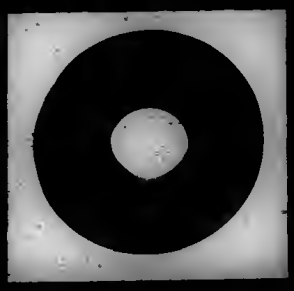
These larger part[illegible]
and the particles. And this mean[illegible]

If you've tried bargain [illegible]
that the dropout level increases as the [illegible]

Epoch 480. It's designed [illegible]

And that's a real bargain.

GRAHAM MAGNETICS



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data consistency checks; Data Mapping controls data conversion and formatting; and Transaction Control covers application and transaction flow. Each resource is partitioned, with well-defined interfaces between them. This is the secret to a modular systems' success. It allows optimized utilization of all the resources and permits additional resources to be dovetailed into the system as needed—without rewrite, without redesign and without degrading system performance.

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**The Things You Can Forget.** The PATHWAY Transaction Processing System capabilities include an Interactive Screen Builder which builds the screens interactively at a terminal, independent of the application [illegible]

[illegible] the [illegible] library and

# AS BATCH.

check the flow and content internally; the Applications Monitor which has power to create, track and alter the application run time environment; and finally the Application Monitor Control Language which lets an operator communicate with an active Application Monitor. It's a powerful system, easy to use and inexpensive. With everything you need to get your on-line transaction applications up and running, with all the benefits of a NonStop™ System, in record time.

**Dynamic Load Balancing.** It comes from taking logical advantage of the multi-processor environment. There is no need for the programmer to consider load balancing with the PATHWAY Transaction Processing System. It's handled automatically; with additional copies of PATHWAY applications started in designated CPUs as needed. And deleted when no longer required. Dynamic load balancing—built into the system's resource management capabilities.

And PATHWAY software also takes full advantage of the unique multi-page storage capabilities built into our new 6520 terminal.

Because terminal mapping translates physical into logical characteristics, programmers can forget about code signal conversions and call on terminals by name. And there's one more major advantage of the PATHWAY Transaction Processing System: one system can be used for convenient development, testing and production of application packages.

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[illegible]

*And Brings Out Data Recorder*

# IDS Enhances Tech Control Center

LINCOLN, R.I. — International Data Sciences, Inc. has released an enhanced version of its Tech Control Center and a microprocessor-based recording device that provides nonvolatile mass storage for digital data.

The Tech Control Center uses IDS' Hawk 4000 Series Datatrap to perform both interactive diagnostics and passive monitoring of serial data appearing at the RS-232 interface to help isolate data communications problems. The unit costs $7,500, the vendor said.

The Model 7000 Datatape is a microprocessor-based recording device that provides nonvolatile mass storage for digital data associated with RS-232C and CCITT V.24 communications interfaces. It can be used as a portable stand-alone unit or in conjunction with the IDS Hawk 4010 Datatrap.

Data can be recorded and later replayed at any one of 16 data rates to facilitate analysis of communications data link problems, according to an IDS spokesman.

The unit costs $5,500 from the vendor at 7 Wellington Road, Lincoln, R.I. 02865.

# *Ambassador Gains Zoom Capability*

ANN ARBOR, Mich. — Ann Arbor Terminals, Inc.'s Ambassador terminal, introduced earlier this year, has now been equipped with a zoom feature that allows an operator to vary the CRT screen's display format from the keyboard.

The CRT terminal is preset by the factory to power on with a 30-line by 80-char. display format. However, the zoom capability allows the operator to move additional lines into the window in order to view larger areas of text. Prices for the Ambassador start at $1,200, the spokesman said from the company at 6175 Jackson Road, Ann Arbor, Mich. 48103.

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# Power Supplies Provide Outputs Of Up to 60V

SANTA MONICA, Calif. — To meet the needs of the telecommunications industry, Pioneer Magnetics, Inc. has expanded its line of switching power supplies to include outputs of up to 60V.

Operating over a broad input range of 92 Vac to 138 Vac and 184 Vac to 250 Vac, the units have a maximum power rating of 750W, or 1,500W for dual-wide units.

The units regulate through line dips to 80Vac or 160Vac. In the event of a total input power loss, output voltage will hold up for a minimum of 30 msec, allowing for orderly shutdown, the firm said.

The Pioneer 375W single-output unit costs $500. Information about other products in the line can be obtained from at 1745 Berkeley St., Santa Monica, Calif. 90404.

# Unit Punches Telex, TWX Tape

WOBURN, Mass. — An automated remote paper tape preparation system that punches telex and TWX tapes in a single typing procedure using standard ball element electric typewriters has been introduced by Leasemark, Inc.

The Papertaper quickly produces 5-track or 8-track punched telecommunications tapes off-line without interruption, the firm said.

The Papertaper costs $3,995 and includes typewriter interface, operator control unit and punch from the firm at 100 Tower Office Park, Woburn, Mass. 01801.


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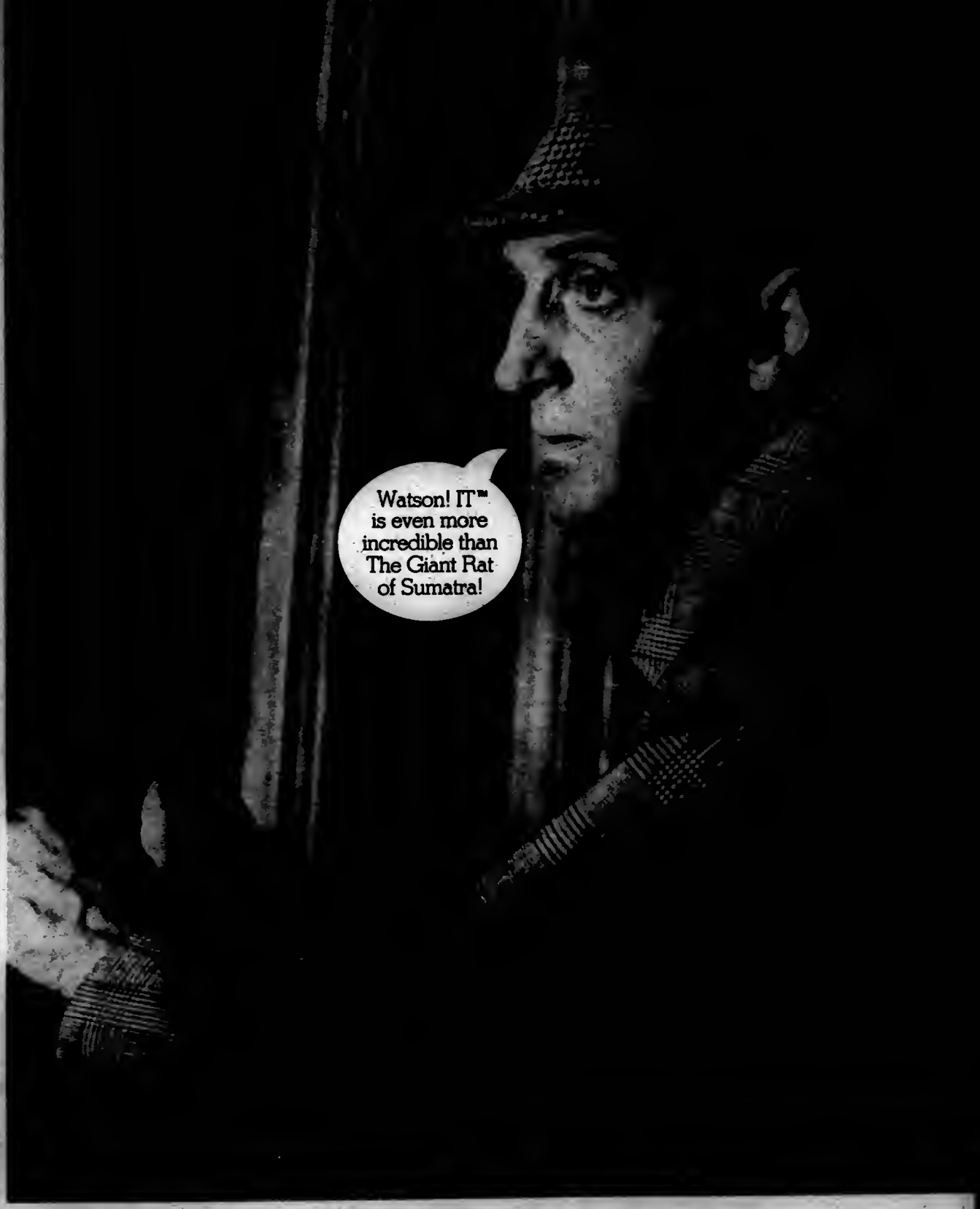


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## Set Handles 1,200 Bit/Sec

NEW BRIGHTON, Minn. — A full-duplex, 1,200 bit/sec, Federal Communications Commission (FCC)-registered modem is available from Multi-Tech Systems, Inc.

The modem works over dial-up and two-wire lines, in asynchronous or synchronous modes.

Designated the MT212D, it is available in both stand-alone and rack-mounted configurations and provides originating and automatic answering capabilities, the vendor said.

The stand-alone unit price is $695, while a rack mounted card set lists for $565 in quantities of eight.

Multi-Tech is at 82 Second Ave. S.E., New Brighton, Minn. 55112.

*For Runs to Seven Miles*

## Asynchronous Unit Debuts

LINCOLN, R.I. — A limited-distance modem for asynchronous operation over telephone company or private two- and four-wire nonloaded metallic (twisted-pair) conductors at speeds up to 9,600 bit/sec is available from International Data Science, Inc.

The modem can be used in both point-to-point and multidrop network configurations and is ideally suited for local data distribution up to seven miles using conventional 26-gauge wire, the vendor claimed.

The Model 6210 employs a pulse modulation scheme that varies the transmit signal polarity on a balanced line. Transmit and receive lines are transformer-coupled, so no continuity is required, a spokesman said.

The modem is priced at $300, the vendor said from 7 Wellington Road, Lincoln, R.I. 02865.

## Unit Converts RS-232 To Burroughs' TDI

CHAMPAIGN, Ill. — Compre Comm, Inc. has introduced a unit that will convert a standard RS-232 interface to a Burroughs Corp. TDI Direct Connect interface.

Called the SR-500, the stand-alone device contains its own power supply and will interface with either an RS-232C modem or terminal equipment, Compre Comm said.

The SR-500 costs $295 from the vendor at 51 E. Chester, Champaign, Ill.

## Modem Called 'Error-Free'

CHATSWORTH, Calif. — Micom Systems, Inc. has introduced a high-speed modem called the Micro5000 that it claimed is error-free because it employs an automatic retransmission-on-error feature.

The unit was designed for use with minicomputers and asynchronous terminals operating at 2,400-, 4,800- or 9,600-bit/sec on standard leased dial-up lines, the vendor said.

The modem costs between $1,500 and $5,500, Micom said from 9551 Irondale Ave., Chatsworth, Calif. 91331.

## Controllers Join Micro Series

COLUMBIA, Md. — Columbia Data Products, Inc. has expanded its Commander microcomputer series with the Communications/Cluster Controller models CC-1 and CC-2.

The CC-1 handles up to 16 ports, while the CC-2 handles up to 32 ports. Through the use of various serial and parallel interfaces, on an optional basis, the CC-1 and CC-2 will interface with "most any" peripheral device desired, according to the firm.

With the use of distributed intelligence to the ports, the device enables the user to implement "dumb" devices and emulate a high degree of intelligence for those devices, a spokesman said.

Prices for the product start at $9,995 from the firm at 9050 Red Branch Road, Columbia, Md. 21045.

## ZMS-70 Update Includes CP/M

SANTA CLARA, Calif. — A new version of Zentec Corp.'s ZMS-70 intelligent terminal features hardware and software enhancements including Digital Research, Inc.'s CP/M operating system and dual double-density floppy disk drives.

Aimed at OEMs, this user-programmable system can be used in both stand-alone and distributed DP environments, according to the vendor.

Single units of the ZMS-70 cost $5,695 from Zentec at 2400 Walsh Ave., Santa Clara, Calif. 95050.

## Analyzer Monitors RS-366 Interface

NORWALK, Conn. — An interface analyzer designed to analyze the EIA/-RS-366 interface to the Bell 801C or an equivalent automatic calling unit has been introduced by Datacomm Management Sciences, Inc.

The TS-366 reportedly monitors the interface to verify that the proper protocol and telephone number are being produced. Active testing is achieved by a front panel LED display of the RS-366 leads and a numeric display of up to 12 dialed digits.

The interface analyzer is a portable, battery-powered unit that comes with a rechargeable battery and charger. The TS-366 costs $600 from 181 Main St., Norwalk, Conn. 06851.


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*Focus on Sessions*

# Graphics Week '80 Draws Few Exhibitors

By Rita Shaw
CW Staff

CAMBRIDGE, Mass. — The recent Graphics Week '80 show here was "the most expensive show per square foot in the world," according to at least one exhibitor, who preferred to remain anonymous.

Expense may have been one of the reasons why relatively few vendors set up exhibits for this conference. However, the exhibitor appeared to be satisfied that the cost was worthwhile. "We've got a good mix of people here, with a large number of middle and high-level DP managers," he said. The result for his firm by mid-week was "lots of firm orders."

Not a single piece of hardware was introduced at the show, although Terak Corp. was exhibiting a color system that had been announced several weeks before at Siggraph 80 in Seattle (see related article).

Trilog, Inc. (the Houston Instrument, Inc. graphics division of Bausch & Lomb, Inc.), Computervision Corp., Xerox Corp., Prime Computers, Inc. and Advanced Electronics Design, Inc. were among the vendors with hardware being displayed.

However, the primary focus of the conference seemed to be on the sessions rather than the exhibits. One attendee perhaps expressed the general feeling of many when he said that "what's frustrating is that no one vendor seems to have everything you need . . . there's always a piece missing."

### IBM Representation

IBM was represented by its 3279 four-color vector graphics terminal. Unlike the crowds that the vendor's display drew during the National Computer Conference (NCC) in Anaheim, Calif., (CW, June 2), the 3279 was receiving relatively little attention from Graphics Week '80 attendees.

The difference may be partially attributed to the fact that IBM was printing copies of the 3279 displays on 3287 four-color printers at NCC while no 3287s were in evidence at the conference, sponsored by the Harvard Laboratory for Computer Graphics.

Conference attendees appeared to be especially interested in some of the hard-copy graphics that were being handed out by various exhibitors. Matrix Instruments, Inc. and Dunn Instruments were both exhibiting imaging cameras that generate color photographs of the graphics being displayed on a terminal. Both displays were attracting traffic to the point that Matrix had been "cleaned out" of data sheets for its product, according to the vendor representative.

The Matrix camera ranges in cost from $11,000 to $29,000, he said, with a single sheet costing "between $5 and $6." Dunn's Model 631 was reproducing images being displayed on a Terak 8600 system on Polaroid 8 in. by 10 in. stock.

When a passerby was asked why he was especially interested in this type of device, he responded that the hard copies are especially useful during management presentations and that they save time. "You don't have to bring up the display again" once you have the hard copy, he noted.

The 8000 series desktop computer from Intelligent Systems Corp. (ISC) drew attention with an eight-color display that provides point plotting on a 160 by 192 grid. The ISC format provides 64 standard Ascii alphanumeric characters with 32 Ascii lowercase characters formed by using a 5 by 7 dot pattern on a 6 by 8 matrix.

Erdas Corp., a relatively new company that specializes in site selection and alternative site evaluation for what it termed "large landholders" (utility companies and the U.S. government agencies were cited as examples) exhibited a microcomputing system that includes a 256 by 240 by 16 interactive color display, dual 8-in. floppy disk drives, a Z80-based microcomputer with 48K bytes of main memory, a dot matrix printer, a digitizer, a CRT terminal and a monitor.

The cost of the basic system is between $26,000 and $30,000, Erdas said.

## *Terak Raster-Scan Display System Shown at Graphics Conference*

SCOTTSDALE, Ariz. — A raster-scan computer graphics display system that will operate either as a stand-alone system or as a terminal in a distributed processing network has been announced by Terak Corp. here.

Designated the 8600, the system was first displayed at the recent Siggraph 80 conference in Seattle. It was also one of the relatively few hardware items being exhibited at the Graphics Week '80 meet sponsored by the Harvard Laboratory for Computer Graphics in Cambridge, Mass., last month.

Featuring dual 16-bit microprocessors, the system is available in two eight-color models with resolutions of 320 by 240 by 3 and 640 by 480 by 3, according to a company spokesman. The 640 by 480 model can be upgraded to display up to 64 colors through the insertion of additional frame buffer boards, which results in a 6-plane memory, Terak said.

Based on hardware and software from Digital Equipment Corp., the desktop system includes a DEC LSI-11 main processor and RT-11 operating system and features Q-Bus compatibility, the vendor representative said.

In addition to RT-11, the 8600 reportedly supports the UCSD Pascal operating system for program development, text editing, word processing and interactive applications, Terak noted.

Support for both operating systems is in accordance with Siggraph 2D1-level standards for Fortran, Basic and Pascal programming languages, the company claimed. This conformity is said to provide transportability of Siggraph standard software between the 8600 and other graphics systems.

The multiple memory planes are controlled by the user and permit simultaneous display and independent manipulation of text and graphics to achieve overlays, scrolling and zoning, he said.

The price range for the 8600 is from $14,750 to $18,950 for commercial customers, while a discounted range of $11,750 to $14,750 is being offered to educational institutions. Approximately 60% of the current Terak customer base is at the university level, the vendor said.

Upgrades for Terak customers with 8510/a black-and-white systems cost from $7,850 to $10,850 with the same upgrade available to educational institutions for between $6,495 and $9,495.

Projected availability is January 1981 from Terak Corp. at 14151 N. 76th St., Scottsdale, Ariz. 85260.

# Bits & Pieces

## Three-Day Seminar to Review Operations Management Skills

CHICAGO — A three-day seminar offering senior DP professionals a chance to review the latest operations management skills will be held in four U.S. cities during late summer and early fall.

Subjects to be covered include setting department standards, planning and scheduling, performance analysis, job accounting, equipment selection, managing the data center, security, recruitment and selection and employee motivation.

There is a $695 tuition fee per person plus a $75 registration fee per organization per seminar, payable in advance, according to the sponsor, the University of Chicago Center for Continuing Education.

More information is available from the sponsor at MC Seminar Division, 1307 E. 60th St., Chicago, Ill. 60637.

## Systems Managers, Offered Reference Manual

VANCOUVER, B.C. — A manual intended primarily for systems managers and consultants that contains more than 20 standard policies and practices for systems management has been released by Augur Data Planning, Inc.

Providing a ready-to-use reference source of standard material for key management areas, the manual is organized into five major sections: "Employee Benefits," "Employee Relations," "Customer Relations," "Marketing" and "Administration."

Within each section, specific ideas are provided for recruiting, job descriptions, performance evaluation, salary administration, vacations, expense reporting, job costing, personnel records and others.

The *Management Policy and Practices Manual* costs $45 from Augur Data Planning, 1401 W. Broadway, Vancouver, B.C. V6H 1H6, Canada.

## Handicapped Get Voice Terminal

BOSTON, Mass. — Arts Computer Products, Inc. has released the Orator, a stand-alone terminal that reportedly interfaces to any host computer and gives the CPU the ability to reproduce vocal commands for handicapped users.

The speech pattern is synthesized to offer unlimited vocabulary, and special commands have been added to specify speech parameters for each task. Users can choose full word or spelled speech, whether to hear punctuation or capitalization and whether to hear speech on input or output, the vendor said.

The Orator costs $10,000 from the vendor at Suite 1260, 80 Boylston St., Boston, Mass. 02116.

## Plotter Gets Cyber, IEEE-488 Links

ANAHEIM, Calif. — Two interfaces for the California Computer Products, Inc. Model 1012 desktop drum plotter — one linking it with Control Data Corp. Cyber 18 computers and the other with the IEEE-488 bus — have been introduced by Calcomp.

Providing parallel input to the Model 1012, each interface is a single-printed circuit board that mounts in the Model 1012's integral controller. No system software modifications are necessary, the firm said.

The Model 1012 is a high-speed, four-pen plotter designed for time-sharing and remote computing applications. It uses fan-folded 11-in. paper and plots at speeds up to 10 in./sec with a resolution of .5mm, the firm stated.

Switch-selectable data rates (from 110- to 9,600 bit/sec) and a 256-byte I/O buffer are included, as is a character generator capable of forming 96 characters in specified sizes and orientations.

The Model 1012 with CDC Cyber 18 interface costs $8,460 and the 1012 with IEEE-488 interface costs $6,940 from Calcomp at 2411 W. LaPalma Ave., Anaheim, Calif. 92801.

## IBM-Compatible Floppy Has RS-232C Interface

MOUNTAIN VIEW, Calif. — Scientific Micro Systems, Inc. has introduced an IBM-compatible floppy disk with RS-232C interface capable of storing 1M byte of IBM double-density formatted data.

Modem controls are provided to support remote site usage of the product, known as the FT02271. In addition, high-speed transfers up to 19.2K bit/sec are supported by the unit's intelligent controller, the vendor claimed.

Up to 65K-byte data transfers occur continuously with automatic seek to successive tracks without host computer interruptions. Alternate command modes allow either Ascii or binary data to be recorded or retrieved to facilitate a variety of applications.

Front-panel controls allow the user to execute self-test and diagnostics independent from the host system to verify correct system operation.

The single unit price is $4,400, the vendor said from 777 E. Middlefield Road, Mountain View, Calif. 94043.

## Matrix Printer Operates At 180 Char./Sec

WOODLAND HILLS, Calif. — A bidirectional 180 char./sec matrix printer under microprocessor control is now available from Pacific Mountain States Corp.

Named the D5180, the unit employs a 94 Ascii char. set printed in a 9 by 7 matrix. True lowercase descenders and simultaneous underlining are possible because of the 9-wire printhead, the vendor said.

An adjustable head-to-platen gap accommodates forms up to six parts in thickness and fanfold perforated forms from 3- to 15-in; may be fed through the front or bottom of the printer.

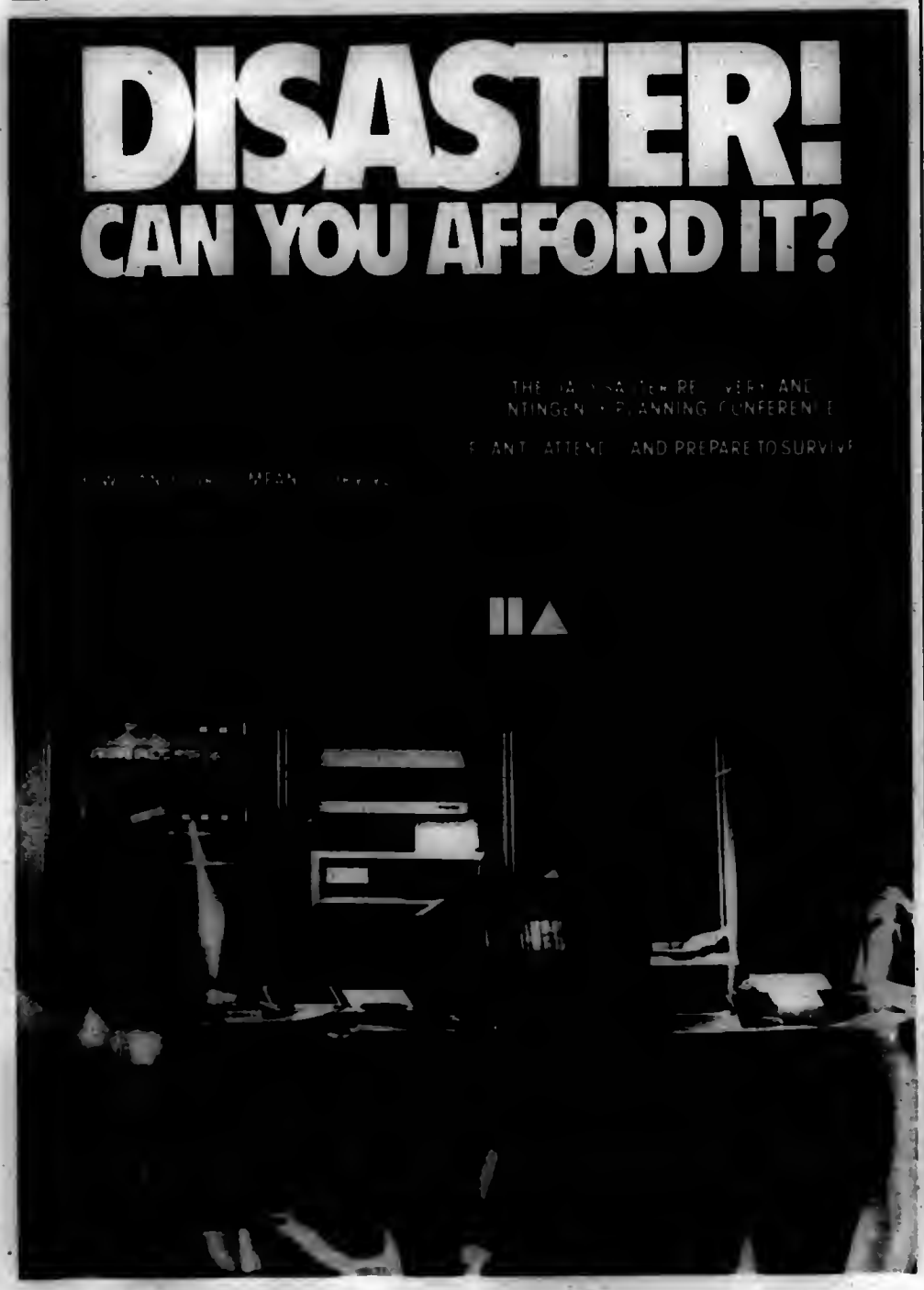
The price of the unit is $1,395, the vendor said from 20601 Deforest St., Woodland Hills, Calif. 91364.

## MCG Offers AC Power Unit To Protect Gear

DEER PARK, N.Y. — MCG Corp. is offering the Model 300 — an ac power conditioner that protects CPUs, terminals, printers and modems from an interruption in service, or loss of data.

The unit protects low and high impedance loads from common and transverse mode transients as well as continuous or intermittent power line noise.

Model 300 costs $135 from the vendor at 160 Brook Ave., Deer Park, N.Y. 11729.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## Mini Bits

### MIC Updates System Report

CHERRY HILL, N.J. — Management Information Corp. (MIC) has released an updated version of its small business computer report which includes business micro- and minicomputer systems introduced during 1980.

"Pathways Through Data Processing: Small Business Systems" is a 200-page report designed to discuss data processing in general and small systems in particular, a spokeswoman said.

The report costs $39 ($49 outside the U.S.) and can be obtained from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

### Dot Matrix Printer Gives Text or Graphics at 100 Char./Sec

FULLERTON, Calif. — An addition to Base 2, Inc.'s Model 800 series of dot matrix printers has been introduced by that vendor. The Model 800B is available with four interfaces: parallel, RS-232, IEEE-488 and 20ma interfacing.

The printer operates at 100 char./sec and can be selected to print text or graphics in six different densities, the vendor said, adding it includes both tractor and friction feeds.

The 800B is capable of carrying 10 character fonts and features full horizontal and vertical tab controls as well as a forms control capability.

The single-unit price for the printer is $699. Base 2 can be reached through P.O. Box 3548, Fullerton, Calif. 92631.

### Turnkey Aimed at Attorneys

VENICE, Calif. — An Attorney Applications Package, including both hardware and software, has been introduced by SDS Business Computers.

Designed by an attorney who holds a graduate degree in computer science, the package is aimed at non-DP personnel. It includes the SDS 420 small business system, an attorney billing system, a word processing package and a financial applications package.

The system includes 32K bytes of memory, expandable to 56K, up to 10M bytes of storage capacity on high-speed dual-diskette drive, a 12-in. CRT display and detachable keyboard.

The complete system, including software and hardware, leases for $400/mo (dependent on current interest rates) or licenses for less than $15,000 from SDS Business Computers at 344 Main St., Venice, Calif. 90291.

*Acquiring a Mini — Part 1*

# Selection Plan Should Go Beyond Logical Analysis

By Nander Brown Jr.
Special to CW

FALLS CHURCH, Va. — Because of their steadily decreasing prices and increasing capabilities, minicomputers are often thought of as the key to solving most or all of a small company's information processing problems.

However, with the minicomputer market fragmentally served by several dozen hardware vendors, several thousand regional software and systems houses and a number of special package vendors, a small company's quest is fraught with potential financial disasters. It is therefore important to apply some rules to the hardware/software acquisition process.

Selecting the best minicomputer vendor for a small firm involves more than just good logical analysis. A well-structured approach is highly recommended.

A small company's first step before embarking on the hardware acquisition road is the feasibility study. This study is a special analysis of the company's need for automation and basically seeks to determine the most cost-effective approach towards automation.

An effective feasibility study actually consists of a series of well-planned steps that outline a particular company's needs for a computer. The first step, planning, sets the groundwork for the rest of the study and can make the difference between a successful venture and a failure.

The second step is the requirements analysis, which involves defining the problem to be solved and identifying the attributes of an acceptable solution as well as constraints on solutions.

In the third step, identifying the alternative solutions, information about feasible alternatives is gathered. The methodology for locating potential suppliers is also discussed.

The fourth step consists of evaluating and determining whether each alternative is economically and technically feasible, that is, whether it can be implemented within cost and environmental constraints.

It is good practice to establish a target date for each phase of the study.

#### Vendors' Role in Study

Equipment vendors may offer to perform, or help perform, the feasibility study for you. This may appear to be an attractive opportunity to get the job done without committing significant resources to it. However,

*In Part 1 of this three-part series focusing on buying a minicomputer, the author offers some tips on vendor selection and outlines a number acquisition methods. Next week he will explore selection criteria, equipment evaluation and contracts.*

while vendors can often provide useful input, they should not be relied upon to recommend the acquisition of a computer from

*(Continued on Page 68)*

# Radio Shack Adds To TRS-80 Lineup

FORT WORTH, Texas — Radio Shack recently beefed up its TRS-80 microcomputer line by introducing a high-resolution "color computer" along with a desktop machine that features expanded data storage capabilities.

The TRS-80 Color Computer has 4K bytes of main memory, expandable to 16K bytes, and plugs into a standard television set via a radio frequency (RF) modulator.

The MPU has a 53-key keyboard, an RS-232C serial interface and 32 characters by 16 lines of color graphics. The device can be user-programmed in Basic, with programs stored on plug-in cassette cartridges.

The TRS-80 Color Computer competes with Texas Instruments, Inc.'s 99/4 microcomputer but costs $399, less than half the price of the TI machine, a spokesman said. It is scheduled to be delivered this fall.

The newly introduced TRS-80 Model III is comparable to and compatible with the models I and II, but can handle more data storage than its predecessors. It can store up to 313K bytes of data on floppy diskettes.

The TRS-80 Model III costs $699 for the 4K version and $2,495 for the 32K-byte machine. Radio Shack, a division of Tandy Corp., is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

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# IBC System 40 Upgraded to 128K Bytes

CARSON, Calif. — Integrated Business Computers (IBC) has upgraded its System 40 with a 128K-byte memory and 96M bytes of disk capacity.

A low-end System 40 features 64K bytes of memory, 2M bytes of floppy disk storage and six serial I/O ports; it can handle up to five CRT terminals and a printer.

The System 40 can now be expanded to a 128K-byte memory and 20M bytes of Winchester disk storage or 96M bytes of fixed/removable disk storage, the vendor said.

The System 40 uses an interrupt-driven compiled Basic and can execute multiple programs with little degradation, the firm claimed. The operating system supports word processing and the Basic supports Isam.

The price for a low-end system with one CRT terminal and one printer is $11,000. A high-end System 40 with five CRTs, one printer, 128K-byte memory, 2M-byte floppy disk storage and 20M-byte hard disk is approximately $24,000.

IBC is headquartered at 22010 S. Wilmington Ave., Carson, Calif. 90745.

# Floppy Disk Controller Debuts

ARLINGTON HEIGHTS, Ill. — An IBM 3740-compatible floppy disk controller designed to provide the interface between a microprocessor system and a floppy disk transport has been introduced by the Electronic Sales and Service Division of Hitachi America, Ltd.

The design of the HD46503/-MC6843 floppy disk controller's hardware enables it to be used in any microprocessor environment.

Featured are programmable seek and settling times, read/write operation and consecutive sectors by a single command and both program-controlled and direct memory address data transfer modes.

The controller costs $25 from Hitachi representatives or franchised distributors or through Hitachi America, Ltd., Electonic Devices Sales and Service Division, 707 W. Algonquin Road, Arlington Heights, Ill. 60005.


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Flexible procedure language enables you to adapt Maestro to any special development techniques.

Program development is offloaded from the mainframe; thus, you postpone or even eliminate the costly need to upgrade.

Programming proceeds independently of mainframe production crunches and downtime.

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# Plan Should Go Beyond Analysis

(Continued from Page 67)

another vendor even if the salesman knows it is the best alternative for your company. In addition, they may not be familiar with other alternatives which are available and will invariably be less knowledgeable about your needs than your own staff is.

If vendor personnel are consulted, they should be used primarily to provide information on the alternatives their company offers.

Consultants can be helpful if used properly. They can bring a variety of specialized skills and knowledge to bear on your data processing problems. The main types and sources of consultants are the following:

1. *General management consultants.* These are usually a source of general data processing management advice.
2. *Certified public accountants (CPAs).* CPA firms may provide services such as management consulting, systems analysis and even programming.
3. *Data processing consultants.* These usually concentrate on systems analysis and programming.
4. *Service bureaus.* These firms sometimes help clients develop systems.
5. *Free-lance consultants.* These are usually associated with small firms, perhaps one-man operations, concentrate on a specific area of business.

### Acquisition Methods

The acquisition method should be chosen carefully. It will probably be based on your availability of technical resources to help in the selection and implementation of the new equipment.

A sole-source approach is the easiest, but not necessarily the best nor most cost-effective method of selecting a computer. This involves selecting one vendor over all the other vendors without competitive bidding or any other disciplined decision making.

Negotiation involves the informal solicitation of vendor policies, pricing structures, equipment capabilities, software availability and other vendor capabilities.

When the evaluation process is completed, the vendor that appears to meet most of the requirements is selected.

The final step is to negotiate with the vendor for the best price available. If several vendors are rated favorably, it is possible to achieve a degree of competition by negotiating with several vendors at one time.

*Brown is the regional audit manager for the Washington, D.C. area office of EDP Audit Controls, Inc., an Oakland, Calif.-based audit firm.*

# Board Has Sockets For Eight Eprom Units

SANTA BARBARA, Calif. — Microsignal, Inc. is offering a 16K-byte memory board that will interface with an onboard Z80 microcomputer.

The IM-1680 board offers 16K bytes of random-access memory (RAM) and sockets for eight 2716 erasable programmable read-only memory (Eprom) units interfaced to Intel Corp.'s Multibus.

The IM-1680 costs $595 from the vendor at Suite 214A, 3704 State St., Santa Barbara, Calif. 93105.

*Advertisement*

# DP Dialogue

Notes and observations from IBM that may prove of interest to data processing professionals

## PLANCODE Displays the Financial Picture for CRT Maker

Six months before the fiscal year begins, financial analysts at GTE start to prepare the operating budget for the Electronic Components Group. To organize and store the data, they use the Planning Control and Decision Evaluation (PLANCODE) system: an IBM program product comprising an easy-to-use, English-like planning language.

"We can revise the figures at any time by making an entry at a terminal," John J. Nugent, vice-president-controller, says, "because PLANCODE automatically recalculates all the affected variables."

At its Seneca Falls, New York, headquarters, the Electronic Components Group makes Sylvania cathode ray tubes for television sets and data systems. Analysts there use PLANCODE on an IBM 4341 System to forecast sales and budget its manufacturing and marketing operations.

"A complete budget represents literally millions of calculations," Nugent observes. "Suppose we want to revise a sales forecast, expected selling price, or standard direct cost assumption. Each of these affects a lot of dependent variables. Changing the sales forecast, for example, has an impact on the extrapolation of cash discounts, defective returns, and transportation costs. With PLANCODE, we can revise any of these major parameters and the system automatically makes the necessary adjustments.

"PLANCODE lets us look at several variables and measure their effect. We can test the sensitivity of a forecast to the variables we're certain of. The plan is better initially, and is easier to revise."

Budgeting has taken on added importance, Nugent points out, as the economy has become more complex. "Knowing our capital needs in advance is critical today," he notes, "so we can decide how to go to the capital market.

"And with PLANCODE we can react faster—if, for example, a major cost item takes an unexpected jump. We have confidence in our results, since we know the math is accurate. The users control the structure of the budget and of the forecasting models, as well as the format of each printed document. This self-service by the users frees the professional programmers to work on the company's primary computer systems, and gives us the flexibility we need for effective financial planning."

*Checking the alignment of a GTE/Sylvania cathode ray tube. Financial analysts at GTE gain flexibility and accuracy by using PLANCODE for forecasting and budgeting.*

## COMBIMAN Sits in for Air Force Pilots

Can a U.S. Air Force pilot readily reach all of the hundreds of controls typically found in a high-performance aircraft? Can he see all of the indicators? How well can he see outside the plane?

Today, at Wright-Patterson Air Force Base in Ohio, the designer of a new plane can answer such questions quickly and easily, by manipulating the COMputerized Biomechanical MAN-Model (COMBIMAN): a model of a human figure in an aircraft cockpit or work station. It permits the designer to sketch a work space around the figure directly on the screen of a computer terminal, using a light pen and the keyboard.

By touching the light pen to a "menu" of options, the user can select the variables that affect movement, reach, and sight lines, such as the size of the pilot, type of harness and clothes. With the cockpit layout and the human figure visible in the display, he can command a programmed "reach" to any selected point. The figure then executes a five-step reach, showing clearly whether—and how easily—a pilot can perform the same operation. The user can vary the proportions of the figure, using realistic combinations of human measurements stored in the computer. He can adjust the work-station design by moving, rotating, adding or eliminating elements.

The program was developed by the University of Dayton Research Institute under the sponsorship of the Aerospace Medical Research Laboratory of the Air Force Systems Command. Says Dr. Joe W. McDaniel, who directs the COMBIMAN project: "In the display, the work space is very easy to modify, to experiment with, so the designer can try many more possibilities. When the physical mockup is first built, it will be much closer to optimum."

The figure can be made to lean or turn its head in order to calculate realistic sight lines for pilots with various body measurements. As with the hand, the reach of the figure's foot can be checked to insure that a pilot can readily reach the rudder control or other pedal.

As the user builds a complete work space, the computer—an IBM System/370—accumulates all of the details. At any time, the system can be commanded to generate a plot of the design on paper.

"COMBIMAN lets the work-space designers get involved much earlier in a project," McDaniel adds. "This avoids later costly retrofit, or the need to compromise on performance."

*The COMBIMAN human figure and work space can be projected on the screen of an IBM 2250 Graphic Display Terminal in an off-axis perspective view. The designer can test and modify a work space by interacting directly with the computer through the terminal.*

*DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.*

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## Time Is Not On The Side Of Time Brokers

By Tim Scannell
CW Staff

NEW YORK — Armed usually with stacks of neatly lettered index cards and a telephone, computer time brokers spend hours wheeling and dealing for computer time, finding just the right seller for the right buyer. But while time is their business, it is also their greatest enemy. Only a handful of dedicated computer time brokers exist today in what was once a highly active field.

"There is a very, very high failure rate in the industry," according to John Rudder, president of Computer Resources, Inc. and self-confessed brokerage veteran. "The availability of hardware is so great today that it's much easier for people to go direct and [there is] much less need for a broker."

Computer Resources is a three-person firm — consisting of Rudder, a secretary and a part-time telephone solicitor — that has been in the computer time brokerage business for nearly 13 years. The company focuses its efforts on the New York metro area and some parts of Philadelphia, and is relatively successful in what Rudder calls "a very limited field."

Although Rudder has never taken the time to count exactly how many computer sites he has on file — except to say that when pressed together the stack of three-by-five cards listing each client takes up about 14 inches of space — he does claim to have a detailed description of every installation in his market area. Computer Resources will list a firm "regardless of whether they do or they don't

(Continued on Page 76)

# Computer Associates Tells Boom Story

By Connie Winkler
CW Staff

JERICHO, N.Y. — Four years ago Computer Associates didn't exist in the U.S. Today the company does $20 million annually in system software business.

The story of Computer Associates, which last year moved to new headquarters in this Long Island suburban community, is one of those true boom stories of privately held computer software companies.

With 300 employees worldwide, Computer Associates recently opened sales offices in Italy, Spain and Canada and is peddling IBM-compatible systems software as far away as Borneo and Kuwait.

### Accent on OS, DOS

The firm sells and leases IBM-compatible systems software, with emphasis on OS and DOS systems. It's most popular product is the one around which it was founded, CA-Sort, which is in 5,600 of its 9,000 world wide installations, a spokesman said.

This year the U.S. company acquired the European Computer Associates company and its 100 employees, according to Charles B. Wang, president. The European company was founded in 1971 by a group of consultants. CA-Sort is one of 12 products the company develops, maintains and markets.

In 1976 when the American company was started by Wang and several partners as a joint venture, there were about 40 employees in the European company.

Computer Associates has found its niche where IBM has not had good products, Wang explained. Those niches include disk space management, tape library management and job accounting within the DP operation, for instance. "It's hard to compete against IBM," Wang acknowledged.

(Continued on Page 74)

*To Block Nixdorf*

# ADR Asks Ruling on Datacom Rights

By Marcia Blumenthal
CW Staff

RICHMOND, Va. — Applied Data Research, Inc. (ADR) has asked the U.S. district court here for a declaratory judgment which, if granted, would prevent Nixdorf Computer Software Co. (NCSC) from licensing and leasing ADR's Datacom products.

The complaint, filed about two weeks ago, is a response to an earlier action by NCSC, which also sought a declaratory ruling on the licensing rights to ADR products.

NCSC is the new name for The Computer Software Co. (TCSC), which was acquired last April by Nixdorf Computer Corp., the U.S. arm of Nixdorf Computer AG, a large West German computer firm [CW, May 26].

While the controversy focuses on the licensing rights, it appears to have other ramifications. Nixdorf is reportedly gearing up to introduce an IBM-compatible system for the European market and needs software capability for that system.

At the same time, ADR has been expanding sales in Euro-

(Continued on Page 76)

# IBM Eyes Cost Cuts, Unity In GSD-OPD Consolidation

ARMONK, N.Y. — In what appears to be a combination cost-cutting move and an attempt to make good its promise to bring more unity to its divisions, IBM has consolidated the product development and manufacturing functions of its General Systems Division (GSD) and Office Products Division (OPD).

Calling the newly formed organization the Information Systems Division, it will make all GSD computer systems and peripherals as well as typewriters, copiers and other small electronic office devices, IBM said.

Since both GSD and OPD will continue to market their own products, industry analysts believe the move was motivated more as a cost-cutting measure than an effort to bring unity to IBM divisions.

However, as the Gartner

(Continued on Page 76)


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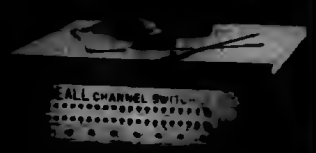


John Beall & Company, Inc

# Vendors Say No to Computing Museum

By Brad Schultz
CW Staff

MAYNARD, Mass. — Some of the nation's leading computer vendors have turned down requests by a citizens group for money to support construction of a computing history museum here.

The nonprofit Maynard Business Investment Group, Inc. (BIG) wants to build the largest U.S. museum devoted exclusively to the history of computer science, according to spokesmen (CW, July 28).

As a tourist attraction, the museum would educate the public and pay tribute to technology that has boosted the economy of Massachusetts for 30 years, Samuel Davis, Maynard BIG executive director, explained. Exhibits of calculating tools from prehistoric times to the present would be featured.

But Digital Equipment Corp. — which has its world headquarters in Maynard — Control Data Corp., NCR Corp. and Texas Instruments, Inc. have all said no to Davis' attempts at securing financial backing.

"After thoughtful consideration of the proposal, we regret that we must decline the opportunity to participate, principally because of our commitment to the ongoing evolution of [DEC's] own computer museum," one of the vendor's executives wrote Davis last month.

"Your plans for a computer museum are intriguing," a CDC spokesman told Davis, "and we fully agree that demonstrating the possible applications to the general public is a worthy ambition."

According to an NCR executive, Davis' proposal was reviewed by the Dayton, Ohio-based vendor's Corporate Contributions Committee — and then rejected.

A TI spokeswoman called the scheme "most interesting" in her rejection letter. "May we wish you all possible success with your fund raising efforts," she wrote Davis.

Davis can be reached at Maynard BIG, 74 Main St., Maynard, Mass. 01754.


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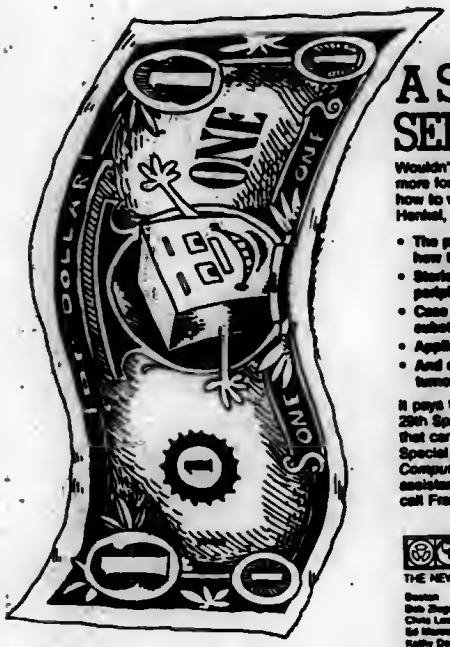

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# DEC Passes $2 Billion Mark For Revenues

MAYNARD, Mass. — Digital Equipment Corp. passed the $2 billion revenue mark and posted a 40% increase in earnings during fiscal 1980 ended June 28.

Fourth-quarter revenues reached $699.3 million, a 33% increase from revenues of $524.2 million reported in the final quarter of the previous fiscal year.

Earnings for the fourth quarter grew 39% — topping $63.7 million or $1.73 per share, compared with earnings of $61.7 million or $1.40 per share for the comparable quarter a year ago.

For the year, DEC's revenues jumped 31% to $2.4 billion, up from $1.8 billion reported last year.

Earnings grew to $249.8 million or $5.45 per share compared to $178.4 million or $4.10 per share reported last year.

The company attributed the healthy growth to strong orders for terminals and the VAX-11/780 system from U.S. and overseas customers.

These higher than expected incoming orders resulted in extended lead times, a situation the company said it is trying to remedy via an expansion plan. The firm currently has a dozen sites in various stages of development and last year spent $209.8 million on equipment and additions to its plant and increased its work force by more than 11,000 people.

At the end of the fiscal year, the firm reported it had shipped more than 235,000 computers.

## Orders & Installations

Morrow Computer Systems of Nashville, Tenn., has ordered 13 V77-600 minicomputers from the Mini-Computer Operations of Univac, a division of Sperry Corp.

The U.S. Navy has begun using color graphics computer terminals manufactured by Chromatics, Inc. for tracking sea vessels at its Atlantic Underwater Test Evaluation Center.

Canton Textile Mills, Inc. has ordered a Burroughs Corp. B2930 medium-scale computer.

Hewlett-Packard Co. has contracted for the purchase of a three-mode nationwide Roadrunner Network Management System from Plantronics Action.

The Athens, Greece, operating subsidiary of Citibank, NA and the government of Singapore have ordered Model 440 Paper Tiger dot matrix printers from Integral Data Systems, Inc.

Arco Oil and Gas Co. of Dallas has ordered a Cray-1S/2300 computer system from Cray Research, Inc.

The Western Union Telegraph Co. has signed a national installation, maintenance and service agreement with Cal Datacom of Santa Ana, Calif. The Cal Datacom CD/300 will be installed by Western Union.

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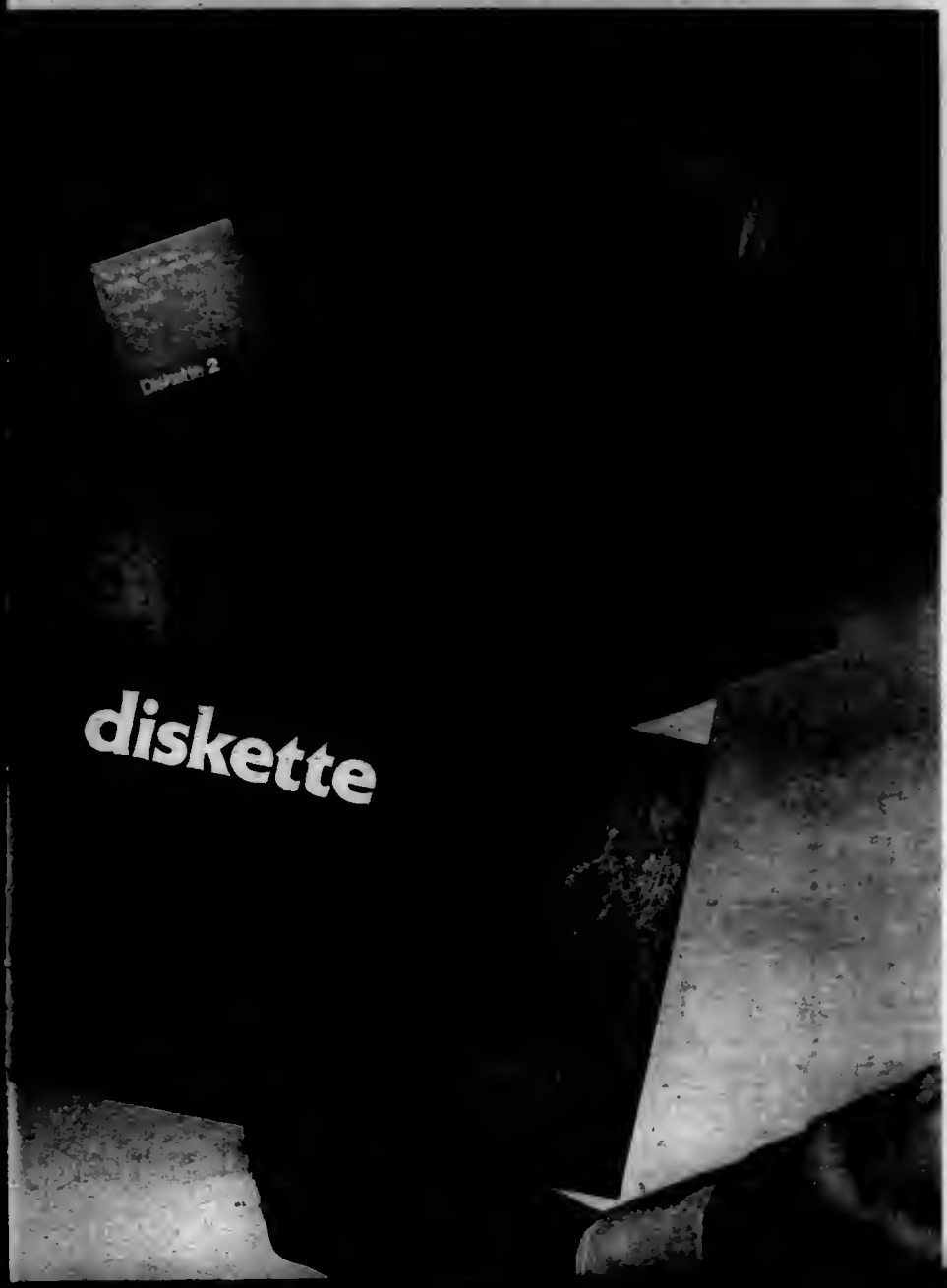


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# Computer Associates Tells Software Boom Story

(Continued from Page 71)

Computer Associates does frequent demand analyses of features and products its customers are asking for. Personnel at offices and technical support centers throughout the U.S. and around the world give regular input for product improvements.

With the new IBM emphasis on software for the 4300 series, Computer Associates is looking for new niches.

The small, independent software house has several advantages: IBM software is not performance-oriented, whereas Computer Associates' is, Wang said.

Moreover, Computer Associates has the advantage of hindsight. IBM products typically evolve and become cumbersome and slower in the process. Computer Associates can look at the ultimate product and come up with better approaches to accomplish the same thing, Wang said.

### New Possibilities

As the software market changes, Computer Associates is looking at applications packages and the acquisition of either software products or companies. Wang would not specify. CA-Jasper, the job accounting system for OS and DOS users, is one such product the company purchased from a smaller firm and integrated into its product line.

One new possibility is applications software for minicomputer and microcomputer systems, Wang said. The firm already has experience with Pascal code, a favorite of mini manufacturers, since it rewrote its CA-Earl file management and report generation system in Pascal.

Computer Associates software is truly field-upgradable and improvements are regular, company spokesmen claimed. The software is both leased or sold with a monthly maintenance charge. The lease base accounts for about 50% of the revenues, and 50% of the lease base is in the U.S.

Wang suspects customers are comfortable with Computer Associates because the company, with a dozen U.S. locations, is large enough to provide good service and its revenues do not come from one product or product range, a spokesman maintained.

There is about an even split of U.S./-European business and employees, Wang said, so that any U.S. economic downturn would be countered by the European operation. However, Wang said, he has seen no signs of recession.

Charles B. Wang

Computer Associates, which is still held by a handful of founders, is looking at additional offices outside the U.S. for future growth and is currently forming an administrative company in Argentina for South American distributors, Wang said.

Wang argued Computer Associates has been successful because of the people it attracted to the business. "We work hard at listening to employees," he said about management efforts. Employees see their ideas implemented and are always given opportunity to present their cases.

The 30 true development staffers in London and Dallas work both in teams and individually on projects, Wang said. The fact that the company is small prevents work being done and then redone by someone else. Headquarters here has in-house IBM 370/135s and 148s for the software specialists.

Wang was formerly involved with Standard Data Corp., a large New York City service bureau, which was a distributor for Computer Associates products in Europe.


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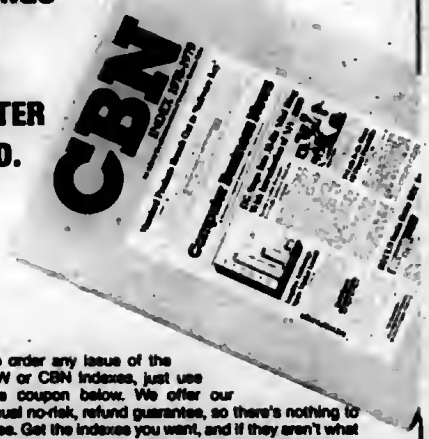


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## Acquisitions

**Dunnelley Marketing**, a company of the Dun & Bradstreet Corp., has announced the purchase of substantially all of the business and the assets of Alcon Data Corp. of Bridgeport, Conn. Alcon Data provides a variety of marketing information software systems.

**General Dynamics Communications, Co.** has acquired the operations of Telephone Systems Management Corp. of Sharon Hill, Pa.

**Automatic Data Processing, Inc.** has acquired Total Systems, Inc., a subsidiary of Kaneb Services, Inc. headquartered in Houston. Total Systems provides DP services for the savings and loan and mortgage banking industries.

**Tymshare, Inc.** has agreed in principle to acquire all the stock of Telecheck Services, Inc., a check guarantee service organization based in Denver.

*Testifying Before House Committee*

# Henriques Urges Tax Breaks as R&D Incentive

CW Washington Bureau

WASHINGTON, D.C. — U.S. tax and fiscal policies should be structured to encourage scientific research and industrial innovation, a DP industry spokesman told the House of Representatives' Ways and Means Committee recently.

"Tax credits for research and development will be of significant advantage in promoting new investment and encouraging innovation," Computer and Business Equipment Manufacturers Association (Cbema) President Vico Henriques told the committee.

Testifying on the proposed Research Revitalization Act of 1980, Henriques said the bill's aim to bolster industry-university R&D cooperation is important, but "it is equally important to recognize the necessity of industrial applied research and development."

The legislation would provide a nonrefundable credit to businesses for 25% of the cash contributions to a research fund, with a maximum credit equal to 5% of the company's business income.

Turning to other measures to boost U.S. R&D efforts, Henriques called for simplified and accelerated depreciation schedules to combat "the serious effect that inflation has on capital recovery.

"Much of the industry I represent has capital investment the useful life of which is less than five years," he noted. "A simplified and graduated approach seems to be indicated so as to accommodate industry-to-industry differences."

The Cbema executive also urged Congress to ease the tax burdens on businesses operating overseas. "Tax discrimination against foreign-source income clearly puts American firms operating abroad at a disadvantage and should be avoided," he said, opposing any "further weakening" of present foreign tax credit and deferral provisions.

## CI Notes

### Sales Training Keyed To Distributed Environment

LOS ANGELES — An advanced sales training program "keyed to today's increasingly competitive distributed data processing environment" has been developed for the sales forces of computer companies by Tratec-McGraw Hill.

Known as "Marketing in the '80s," the program consists of a three-day workshop in which participants are exposed to workbooks as well as to audio and video case studies adaptable to the needs of most computer organizations.

Organized into seven parts, the program was designed to give salesmen a better understanding of the computer industry, changes likely to affect their customers and means of gaining and keeping new accounts in a rapidly changing business environment, a Tratec spokesman said.

Additional information on "Marketing in the '80s" can be obtained from J. William Jarrett, director of marketing, Tratec-McGraw Hill, 2999 Overland Ave., Los Angeles, Calif. 90064.

### Honeywell Center to Direct Distributed Systems Center

PHOENIX — The formation of a Distributed Systems and Communications Center within Honeywell, Inc.'a Large Information Systems Division (LISD) here has been announced by Richard R. Douglas, the division'a vice-president and general manager.

The center will have overall program management responsibilities, including planning, architecture, design, development and support for the company'a current and future distributed systems products.

Its formation follows the assignment to LISD of the overall responsibility for Honeywell'a distributed systems products.

### Firm Specializes In Business Strategies

STANFORD, Calif. — The Business Development Group, Inc. has been formed here to specialize in the assessment, development and support of business strategy for high-technology companies.

The firm offers three basic services: advisory and consulting projects; strategy and information reports; and tactical support programs.

Additional information is available from Daniel Drucker, Business Development Group, P.O. Box 3044, Stanford, Calif. 94305.

### Integral Data Signs 14 Distributors in Year

NATICK, Mass. — Printer manufacturer Integral Data Systems, Inc. has signed 14 distributors worldwide in the past year.

Before last August, IDS sold internationally through a small export agency in Boston.

To meet a higher than expected foreign demand, IDS said it has scheduled production increases of the Model 440 matrix printer, the first member of its Paper Tiger family.

### SSE '81 Booking Space

PHOENIX — The Southwest Semiconductor Exposition (SSE '81), which will be held March 24-26 at the Phoenix Civic Plaza Convention Center, is now booking exhibitor space.

SSE '80 attracted 138 equipment and materials makers who exhibited more than $12 million of semiconductor, hybrid and printed circuit board production, processing and test equipment. More than 100 booths have already been reserved by the premiere 1980 exhibitors.

Space can be reserved by contacting the show manager, Cartlidge & Associates, Inc., Suite 1014, 491 Macara Ave., Sunnyvale, Calif. 94086.

### AEA Sets East Coast Event

PALO ALTO, Calif. — The American Electronics Association (AEA) is taking its West Coast Spring Conference on the road.

Chief executives from emerging high-technology companies that are interested in possible mergers, acquisitions or additional funding will have an opportunity to meet with members of the financial community at AEA's East Coast Financial Conference Nov. 17-19 in Danvers, Mass.

The conference is open to publicly traded electronics firms with annual sales of less than $20 million and to privately held companies of any size. Both AEA member firms and nonmember companies are eligible to attend, although the conference is limited to 30 electronics companies.

Additional information on the show is available from the AEA, 2600 El Camino Real, Palo Alto, Calif. 94306.

### CDC Announces Opening Of Japan Cybernet Center

MINNEAPOLIS — Control Data Corp. has announced the opening of the Japan Cybernet Center in Tokyo.

The center eventually will be the largest of CDC'a shared-time computer services facilities outside the U.S., according to Herbert M. Hughes, vice-president of Pan Am/Pacific/Far East Operations.

In addition, the Japan center will be the first outside this country to include the Cyber 205 supercomputer. It is scheduled for installation by the end of 1981 or the beginning of 1982.


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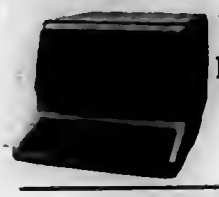

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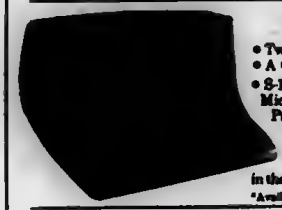

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# Time Working Against Computer Time Brokers

(Continued from Page 71)

sell time, whether they have a company policy against it or if they have a security-cleared installation," he pointed out.

Rudder's card files are updated about every six months, and more frequently for those clients he deals with on a regular basis.

### 'Chaperone' Service

Basically, Rudder and his staff spend a great deal of time on the telephone matching buyers with sellers, acting as a sort of data processing chaperone during the initial contact. And like an overprotective father, Rudder makes it a point to know a little bit about the firms he deals with so that the first time-sharing data won't necessarily be the last.

For instance, common sense and experience will tell you that you can't buy processing time from a department store during the Easter or Christmas seasons, Rudder said.

"One of the things to know is when outfits are busy and when they are slow, what type of work they like and what type they dislike, what they are good at and what they are bad at, and things like that," he noted.

The profile of a typical Computer Resources customer might be a firm that was previously using a terminal to do its processing with an out-of-state home office, but temporarily has to find another computer host when headquarters decides to upgrade or scrap its present mainframe, Rudder explained.

The computer time brokerage's fees normally run about 15% to 20% of the total processing cost and is invariably picked up by the seller. The seller will then turn around and bill the customer for the computer time.

### Buyer/Seller Referee

While DP matchmaking takes up the bulk of his time, Rudder — a former lawyer who entered the business because "it didn't require much capital" — also spends a fair amount of time smoothing problems that may erupt in the course of his buyer/seller marriages.

Acting as a referee, he will often present buyer criticisms to the seller, help a buyer reach the right person in a company and, in a few cases, step between two parties when there are "angry stares and possibly a punch in the nose."

Most of the time Rudder will busy himself negotiating goodwill between the seller and a disgruntled buyer.

The seller "knows that if I say something's the right thing to do and he doesn't do it then the next time I get a lead I may think over who to bring that lead to and say 'so and so's kind of a hard case, he doesn't like to give an inch for goodwill' and I'll go to somebody else," he commented.

In any case, Rudder accepts his mediator's role as part and parcel of the whole brokerage job. "Anyone in the business who hasn't had some dissatisfaction is either a mighty strange person or he's been in the business a very short while," he claimed.

### Supplement Activities

Even though Computer Resources is one of the few brokerage firms that deals only in computer time as a business, it does have a number of competitors in the New York metro area. One of these competitors, Computer Placement, Inc., is also a three-person shop, but sells computer supplies to supplement its brokerage activities.

"There may be thousands of sellers that are never candidates for computer time just because they don't need it, but each and every one of those people, of course, needs supplies," Bob Klar, president of Computer Placement, said.

Klar has been in the time brokerage business about 12 years and has been selling computer supplies for the past six years. He deals with about 200 customers on a regular basis, but has a client list of 2,000 companies.

Like Rudder, Klar is relatively successful as a broker, but decided to sell supplies because it is basically a nontechnical business that uses the same contacts as for marketing computer time.

Oddly enough, both Rudder and Klar maintain that despite an overall downturn of the computer time brokerage field, their businesses are not yet ready for extinction.

"There's a smaller pie, but fewer people are cutting it up," Rudder added. "So long as the market doesn't shrink much more and there aren't any new entrants, there's enough business for everyone to stay alive."

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# Ruling Asked on Datacom Rights

(Continued from Page 71)

pean markets, opening nine subsidiaries in Europe over the last year, according to Carol Cohen, ADR vice-president and general counsel.

Because Nixdorf is a large European company, it could present ADR's subsidiaries formidable competition in the European IBM software market, a source noted.

Prior to Nixdorf's acquisition of TCSC, ADR permitted TCSC to license its Datacom/-DB, a data base management system, and its Datacom/DC data communications software, to users of TCSC's IBM-compatible operating system, the Extended Disk Operating System (Edos).

### Insyte Acquisition

ADR held ownership to those packages by acquiring the assets of Insyte Datacom Corp. Under the terms of that acquisition, ADR agreed to honor "obligations and responsibilities" of Insyte in relation to its agreement to TCSC, the complaint noted.

However, ADR claims that by selling its stock to the JTG Holding Co., the stock of which was later acquired by Nixdorf Computer, NCSC assigned its rights to the software, which was in violation of the licensing agreement.

Countering that claim, NCSC argued the sale of the stock to the holding company did not constitute a merger or consolidation of the firm with any other company and therefore was not an assignment of rights in violation of its agreement with ADR.

Furthermore, ADR contends that NCSC "made available or intends to make available the Datacom system to users of hardware systems other than IBM hardware systems, including users of hardware systems manufactured by Nixdorf Computer AG or Nixdorf Computer Corp."

In its counterclaim, ADR also denied the NCSC argument that Edos is intended for use with IBM-compatible hardware.

No date has been set for the hearing on the matter.

# IBM Meshes GSD, OPD

(Continued from Page 71)

Group's Dave Stein noted, OPD and GSD have been making similar products for some time. The consolidation may serve the dual purpose of eliminating some duplicated efforts, he said.

IBM has had a similar arrangement in the European market since early 1975. Plans were under way in October 1978 to impliment a similar policy in the U.S. [CW, Oct. 23, 1978], but those plans were scrapped when IBM was accused of becoming like General Motors, a super-large firm made up of smaller subsidiaries.

IBM Vice-President of manufacturing, Robert B. Dunlop will head the new division, but he will also retain his current position, IBM said.

# Contracts

Softech, Inc. has been awarded a $2 million, three-year contract from the Ballistic Missiles Office, Norton Air Force Base, Calif., to build a Jovial compiler for the MX missile program.

James S. Kemper & Co. has signed a multisystem contract with Minicomputer Systems Technology, Inc. (MST), developer of the Abacus minicomputer system for independent insurance agents. MST will deliver a number of Abacus computer systems to Kemper offices throughout the country.

Computer Sciences Corp. has been awarded a seven-year contract for continued management of Pierce County, Wash.'s computer facility.

POSITION ANNOUNCEMENTS

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# Computer Sciences Corporation

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# POSITIONS

### Program Managers, Software Systems Administrators

Government Agency is recruiting for Program Managers, Software Systems Administrators. Must have college level understanding of computer science or directly related field experience. Must have two years general experience in a job situation requiring an in-depth knowledge of assembler and IBM control language and utilities. Must have four years specialized experience in installation and maintenance of IBM system control programs (MVS, MVT, SVS) including SYSGEN, TSO/TCAM, Job entry sub-systems (JES2/HASP) and installation and maintenance of vendor software products such as compilers, sort routines and various utilities on an IBM 370 and COMTEN front-end. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 26,836 — 40,326. Send to CW Box 2697.

### Telecommunications Hardware Technicians

Government Agency is recruiting for Telecommunications Hardware Technicians. Must have two (2) years experience in communications circuitry, audio and visual. Experience in communication systems operations including diagnostic understanding and application. General understanding of data processing systems, modems, multiplexing, and network concept. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 18,001 — 22,522. Send to CW Box 2692.

### Data Base Administrators

Government Agency is recruiting for Data Base Administrators. Must have four years experience in computer programming, systems analysis and design. Minimum of three years experience in COBOL, LIBRARIAN, and JCL on an IBM operating system or comparable system. Minimum two years experience in use of a Data Base Management System. Knowledge of IDMS Intercomm desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 27,108 — 37,948. Send to CW Box 2694.

### Systems Programmers

Government Agency is recruiting for Systems Programmers. Must have three years experience with generation and maintenance of an IBM operating system or a comparable operating system. Extensive experience in complex computer programming and hardware analysis. Working knowledge of IBM Assembler language, utilities and JCL is required. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 25,733 — 36,027. Send to CW Box 2698.

### Computer Programmers

Government Agency is recruiting for Computer Programmers. Must have a minimum of two (2) years experience in programming for applications emphasizing extensive data manipulation, using ANS COBOL and Time Sharing (TSO) for the IBM 360/65, IBM 370/158, or a comparable system. Experience in other programming languages such as FORTRAN and MARK IV is desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 19,807 — 24,936. Send to CW Box 2688.

### Job Control Specialists

Government Agency is recruiting for Job Control Specialists. Must have three years experience in computer programming and/or operations. Extensive experience in JCL, utilities, and operating systems. Experience with MVS and TSO desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 16,815 — 20,656. Send to CW Box 2686.

### Computer Systems Operators, Sr.

Government Agency is recruiting for Computer Systems Operators, Senior. Must have two years specialized hands-on experience in the operation of fourth generation computer systems and two years of general-ADP experience. Knowledge of JCL and basic programming desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 18,293 — 19,772. Send to CW Box 2689.

### Systems Programmers, Sr.

Government Agency is recruiting for Systems Programmers, Senior. Must have four years experience with generation and maintenance of an IBM operating system or a comparable operating system. Extensive experience in complex computer programming, problem determination and analysis of both hardware and software related problems. Working knowledge of IBM Assembler language, utilities and JCL is required. Experience with MVS, TSO, JES2 and Intercomm is desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 27,108 — 37,948. Send to CW Box 2695.

### Computer Programmers, Sr.

Government Agency is recruiting for Computer Programmers, Senior. Must have a minimum of three (3) years experience in programming for applications emphasizing data manipulation using ANS COBOL. Also required is a minimum of two (2) years experience with Time Sharing (TSO) and Job Control Language (JCL) for the IBM 360/195, IBM 370/158, or a comparable system. Experience in FORTRAN, MARK IV, ALC and Librarian is desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 22,000 — 30,000. Send to CW Box 2691.

### Teleprocessing Support Specialists

Government Agency is recruiting for Teleprocessing Support Specialists. Must have three (3) years experience in communications/teleprocessing. Working experience using assembly level languages is required. Knowledge of communication carriers, tariffs, data processing techniques, and computer operations. Knowledge of minicomputers and microprocessors is desirable. Locations: Minneapolis, MN — New York, NY — St. Louis, MO — San Bruno, CA. Salary Range: 24,361 — 34,165. Send to CW Box 2693.

**All responses should be directed to the appropriate CW Box at 375 Cochituate Rd., Rte 30, Framingham, MA 01701**

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BS/MS/PhD Computer Science (or similar) with strong academic background in tool construction and computer architecture (instruction set, memory addressing, etc.). Microprocessor programming and compiler construction including emphasis on code generation is extremely useful. Thorough experience in structured implementation strategies as applied to practical programming tasks is expected.

**Related Job Experience**

Successful candidates will have 4 or more years in practical software implementation tool development work. You will have experience in the development of block-structured language compilers, code generation, and optimization.

**Job Specifications**

Candidates should be willing to work within a closely-knit team environment during the process of tool specification and design and then take personal responsibility for key functional areas within the tools and/or complete responsibility for the implementation of individual tools.

Candidates should expect to enter as individual key contributors to the team effort and may expect professional growth in both technical and project leadership/ management directions based upon performance, project expansion, and their own personal preferences.

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EDP Planners in Saudi Arabia are involved with one or more of the following assignments:

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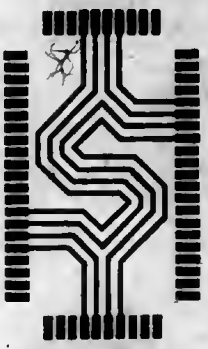

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Applicants and nominees should have an M.S. in Computer Science, or closely related field, and should have several years of demonstrated responsible technical management experience, preferably in a large computer installation. Excellent writing and oral skills, and the ability to work harmoniously and effectively with various internal and external individuals and organizations are required. Experience in higher education is preferred.

Persons interested in the position are requested to submit information concerning the scope of their experience and responsibilities. Applications and nominations should be submitted to Dr. Warren W. Staub, V.P. for Gen. Adm. University of Maryland, Adelphi, Md. 20783, by September 5, 1980.

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- Systems Analysis/Design
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- Establish Communication Networks

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**Hardware:** IBM 370-158, 3032, 4300, 8100, CDC Cyber Series, Prime 550, DATAPOINT, HP1000 & 3000, and DEC Series 8, 10 & 11's

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- O/S JCL
- IMS DL-1

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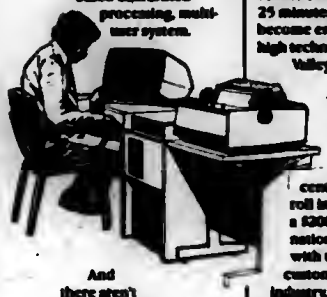

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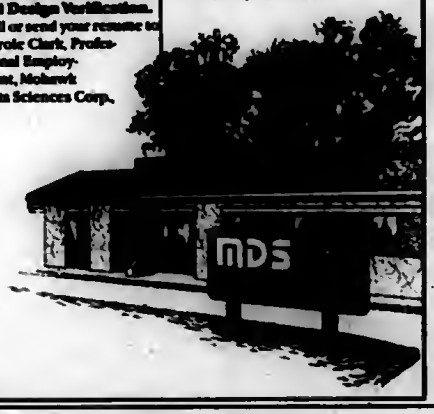
Investigate our excellent opportunities for Systems Programmers and all software development professionals in the areas of O/S Development, Data Base Design, Communications, Systems Architecture, Product Planning and Design Verification. Call or send your resume to Carole Clark, Professional Employment, Mohawk Data Sciences Corp., Advanced Development Center, 102 Cooper Court, Los Gatos, CA 95030; (408) 395-2160. We are an equal opportunity employer m/f/h.

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We are one of the country's largest and most successful publishing companies. We produce a wide range of products from consumer and professional magazines to directories and other informational products.

We are now expanding into a data processing publishing market and are looking for a highly professional editor to manage a business publication.

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This position potentially offers a "fast-track" in the company's fast-growing business publications division. Salary and benefits are highly competitive. The location of the position is in the Philadelphia metropolitan area. If relocation is required, the company will pay expenses.

If you possess the qualifications that we require, and are the type of an individual who wants the challenge and exposure that launching a new publication can provide, respond in confidence, with salary requirements to:

Personnel Department, DPB
**ZIFF-DAVIS**
Publishing Company
One Park Avenue, New York, New York 10016
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- Systems Programmers IMS DB/DC with NCP and VTAM .... 32K
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Many other positions available. All fees, interview and relocation expenses are paid. Rush confidential resume and earnings history to:

James E. Bernard, President
R. P. INTA, INC.
1211 S. Westshore Blvd., Suite 107
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  Development
- Software Systems

- Computer
  Software
- End User
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- Hospital Experience
- Sales Experience

ar MEDICAL MANAGEMENT INC.

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We are paid by our customer clients to assist them in obtaining the talent needed for their continuing growth. Your presentation to a potential employer is personal and confidential. Our clients pay all interview and relocation expenses.

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TECHNICAL ANALYST — $30-40K
3 yrs. MVS, JES-2/JES-3, PL1 experience. Ability to debug and read operating systems dumps. COBOL or FORTRAN a plus. Degree required.

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IMS exp. required. 2 yrs design & analysis. DB/DC generations.

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SYSTEMS ANALYST — $30-40K
3-4 yrs. experience in manufacturing, sales, marketing or financial systems.
PROGRAMMER/ANALYST — $30-40K
Required 3 yrs. experience in financial, marketing, sales, manufacturing systems analysis and design. IBM experience 370/158/3000 series, DOS/VS environment, IMS or TOTAL, DBMS exp. 4 plus. DOS/OS operating system exposure.
PROGRAMMER/ANALYST — $20-30K
2 yrs. OS/JCL, disk access, COBOL programming, business systems development, 370/158, 4300 experience in multiprocessor environment. RPG. Employee exp. 1 plus.

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## East & West Coast Locations

Annual sales approaching $1 billion reflect much more than just growth at National Semiconductor. It reflects our commitment to provide quality people with the resources they need to reach their goals, as well as ours.

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Your responsibilities will include training, supervising and motivating our memory system sales representatives. We estimate that our sales managers will have approximately 75% travel. A background in systems sales is required and minicomputer sales experience would be a definite plus.

Please send your resume in complete confidence to **Nancy McAuliffe, Professional Employment, P.O. Box 2699, Dept. 3-61-1, Santa Clara, CA 95061; or call her COLLECT at (408) 737-5648.** An affirmative action employer.

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DATA PROCESSING

# PROJECT MANAGER

The Office of the Chancellor of the California State University and Colleges has an excellent job opportunity. Recent internal promotion has created a vacancy at the senior project management level. Position reports to the Associate Director, Administrative Systems Group, and is responsible for the Data Administration, Standards and Master Project Control functions. This is a high visibility, fast track position. Minimum qualifications are: Four years of varied and progressively responsible data processing experience above the journeyman programmer level; equivalent to graduation from college; recent COBOL programming experience; and highly developed communication and interpersonal skills. Machine environment is CDC Cyber 760 and 730-2. Salary: $30,516 - $36,864 annually. Work Location: Mid-Wilshire, Los Angeles.

Send resume to include salary history no later than August 31,1980 to:

**Personnel Services / Office of the Chancellor**
**The California State University and Colleges**
**400 Golden Shore, Suite 112**
**Long Beach, CA 90802**
**Reference: # 07**
or call collect
**Alex Wake (213) 982- 5747**
**Joe Bish (213) 982-5756**

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# PROGRAMMER/ANALYST

## *Florida Positions*

Due to rapid growth and the influx of many major corporations to the Florida market the opportunities for Data Processing professionals in all applications fields have never been better. We have many current up-to-date openings in Florida and throughout the nation, with companies that offer job stability, advancement, excellent benefits and full relocation. We are in a position to market your specific skills in manufacturing, banking, financial or general business environment from micros to mainframes. Since we deal solely with Data Processing professionals, you can be assured that we will find you the position that will fit your qualifications and meet your personal and professional goals. All service charges and interview expenses are paid by our client companies. Call collect or send your resume to Mike Mitchell.

**J.P. INTERNATIONAL, INC.**
DATA PROCESSING DIVISION
320 No. Federal Hwy., Suite 234
Pompano Beach, Fla. 33062
(305) 942-5670

# Data Processing Operations Professionals

Our client, a major financial institution based in San Francisco, has engaged us to find a number of EDP Operations Professionals. All of the positions offer excellent compensation.

State-of-the-Art IBM 370/158, 168 or 3033 MVS, IMS, INTERCOMM, TSO skills are required. Management, supervisory and technical positions are available in Computer Processing, Operations Support and Telecommunications Center.

We are consultants to management. If you can meet the challenge of a multi CPU MVS environment, send a detailed resume and salary history to John L. Maketi, Professionals for Computing, Inc., One Maritime Plaza, Suite 1200, San Francisco, CA 94111. (415) 986-7120. Employer assumes fee.

professionals for computing, inc.
Search & Personnel Services

## SYSTEMS PROGRAMMER

Leading manufacturer of floor covering and adhesives products based near Los Angeles, 4331 DOS/VSE Shop, seeks experienced EDP professional required for system maintenance and technical programming support for data base on-line systems and communications. Experienced and proficient in DOS systems programming, assembler, COBOL required. Knowledge or experience of CICS, DLI, ICCF, VSAM desirable. Excellent benefits. Send resume, including salary history to:

Personnel Department
ROBERTS Consolidated Industries, Inc.
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SALARY $18-28,000

**Oil-Related Industries**
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SALARY $18-25,000

There are multiple positions within each grouping above, plus many companies are being represented.

CALL JIM FLEMING COLLECT AT 713/986-1000 FOR FURTHER INFORMATION OR SEND YOUR CURRENT RESUME TO:

ROBERT HALF
EDP DIVISION
720 E. Post Oak Rd. (#25)
Houston, Texas 77024

## Project Activities

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- Facilities Planning
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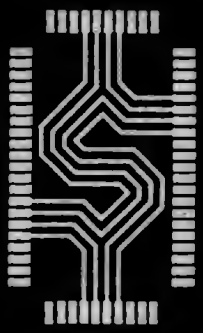
- Workflow Analysis
- Proof Systems
- Accounting Systems
- Control Systems
- Reject Re-entry
- Tracing and Adjustments
- Signature Verification



## Configuration Manager

We are seeking a well mannered individual with minimum of a Bachelor's degree in Computer Science with 1 year experience in programming and implementation of computers or other large systems, and a working knowledge of IBM 370. Duties include to develop and enforce configuration management standards for all Computer Development Group (CDG) implementation projects. To maintain and distribute base line versions of all systems under development by CDG and develop and program software tools to aid in these tasks. Salary $20,700 plus benefits.

Send resume to Judith C. Forsythe, SoftTech, Inc., 460 Totten Pond Road, Waltham, MA 02154

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The R&D center is one of the largest and most diversified industrial laboratories in the world. It is located in scenic upstate New York, approximately 150 miles from both New York City and Boston.

Investigate excellent salary, benefits, and growth prospects by sending your confidential resume to: Mr. Neil T. Dietrich, University Relations and Recruiting, General Electric Research and Development Center, Ref. 48S, P.O. Box 8, Schenectady, New York 12301. Or call COLLECT (518) 385-6322

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$18,000 to $37,000 to start

Due to rapid growth and the influx of many major corporations to the Florida market, the opportunities for Data Processing professionals in all applications fields have never been better. [illegible]

ALAN [illegible] ASSOCIATES, INC.
[illegible]
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Service charge assumed by client companies

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## SENIOR ANALYST

Corporate level position for seasoned programmer analyst. Consumer products mfg. located in Western NY needs analyst with track record in COBOL and/or PL1. Top notch peer group presently revamping financial & mfg. systems. Some maintenance. Salary $26,000. Contact Pam Siegel.

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Requires Computer Science or EE degree and 3 to 5 years in communications software. Familiarity with widely used protocols (ASCII, BSC, SNA, HDLC, SDLC, etc.) and terminals (IBM 3270, 2780, 2770, etc.).

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| | |
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| Systems Analyst, MFG | 30K |
| P/A, MFG, 370, Degree | 25K |
| P/A, S/3-15D, CCP | 23K |
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| Programmer, COBOL | 20K |
| Programmer, PL-1 | 20K |
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No contract and all fees paid. Mail confidential resume to:

Excel Personnel
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Greenville, S.C. 29607
Phone: (803) 233-2346

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L.A./San Fran/Dallas/Houston
[illegible]/New York

PROJECT [illegible] banking
CHIPS-SWIFT [illegible] TELEX ........ [illegible]
[illegible] banking CHIPS SWIFT ........ [illegible]

**NEW YORK**

PROJ LDR-Banking DOS VS CICS COBOL ........ [illegible]
FINANCIAL [illegible] G/L [illegible] ........ [illegible]
SOFTWARE [illegible] BAL TCAM ........ [illegible]
SYSTEMS [illegible] 370 BAL OS ........ [illegible]
PLANNING [illegible] ........ [illegible]
ADVANCED Tech group software [illegible] ........ [illegible]
PROJ Ldr [illegible] BAL ........ [illegible]
SOFTWARE Mgr DOS CICS DL 1 DC ........ [illegible]
SYSTEMS ANAL TANDEM ALP ........ [illegible]
EDP Audit Fortune 100 co [illegible] ........ [illegible]
SYSTEMS ANAL-G/L Acct. [illegible] CICS ........ [illegible]
SOFTWARE OS MVS VS 1 ........ [illegible]

**NEW JERSEY**

PROJ LDR [illegible] OS COBOL ........ [illegible]
MGR Data communications ........ [illegible]
SYS PROG IMS Data dictionary MVS OS VS TCAM ........ [illegible]
EDP Auditor [illegible] ........ [illegible]
SOFTWARE CICS ........ [illegible]
SOFTWARE MVS ........ [illegible]
SOFTWARE ACF-VTAM ........ [illegible]
PDP 11 VAX FORTRAN ........ [illegible]
PROJ LDR DOS VS COBOL [illegible] ........ [illegible]
PROJ LDR HP 3000 IMAGE QUERY COBOL ........ [illegible]

**WESTCHESTER/CONN.**

PhD Computer Sci-Graphics Software ........ [illegible]
GROUP LDR microprocessor software ........ [illegible]
SOFTWARE DEC 10 TOPS [illegible] DECNET ........ [illegible]
HARDWARE ANAL-DECNET VAX Fortran ........ [illegible]
PROJ LDR [illegible] OS DOS CICS ........ [illegible]
SOFTWARE Special purpose comp software engineering ........ [illegible]
MICROPROCESSOR software analysis & design degree ........ [illegible]
PROJ Ldr CICS COBOL DOS ........ [illegible]

Call [illegible] (212) [illegible]

**[illegible] HARRIS ASSOC**

[illegible] Broadway NY [illegible] (agency)

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# MAINE

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SYSTEMS ANALYSTS
MANAGERS

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## Programmer Analyst

This position requires 3-5 years of deposit and/or loan system application experience in a medium to large IBM environment. CICS experience highly desirable. Must be a highly motivated career individual able to work in a very rapidly changing environment.

## Programmer Analyst

This individual must have proven experience with the UCC super M/CRII product. The successful candidate will possess 3-5 years of experience in a large bank and a strong background in item processing.

The bank offers excellent salaries and a competitive benefit package along with the opportunity to grow professionally as fast as your skills allow. Send resume and salary history to Great Western Bank, Personnel Department, 135 West Monroe, Phoenix, Arizona 85001.

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New York City-Chicago-Philadelphia-[illegible]-[illegible] & Hartford CT-London, England

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## DIRECTOR OF COMPUTER SUPPORT SERVICES

Ohio University is seeking an experienced professional to DIRECT COMPUTER OPERATIONS AND SYSTEMS PROGRAMMING FUNCTIONS of the university computer center.

Major responsibilities are to maintain an efficient and dependable computer operation, maximize computer thruput, supervise operations, systems programming and data entry staffs and provide technical advice and support to other elements of the department.

Qualifications include degree plus 5 years experience in computer operations and systems programming or equivalent and knowledge of IBM operating systems and utilities.

Current computer is 370/158 operating under OS/VS1 and VM 370.

Salary: $23,000-$28,000

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## DIRECTOR COMPUTER CENTER

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Position Description: Responsible for insuring that the proper level of computerized and information processing support is made available to support the instructional, research, administrative and public service function of the University. Work with the administration, faculty and staff to determine the needs of the University and develop systems to meet those needs. Develop short and long-term budget plans for information support and cost levels. Direct maintenance of other systems, as could budget production. Reports to the Vice President of Administrative Services.

Qualifications: Advanced degree in Computer Science or early related field desired. Three to five years of supervisory/administrative experience in data processing. Broad knowledge of computer equipment and programming systems. Managerial and supervisory skills.

Application deadline: Sept. 15, 1980.
Starting date immediately
Salary: Open

Apply to Dr. Bill E. Gibson,
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Personnel Office, Southeast Missouri State University,
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Established food wholesaler in Florida requires Senior Programmer Analyst. Prefer 2-3 years experience in the food industry.

Exceptional applicant should have a background in IBM equipment using DOS/VSE with CICS and ICCF. Excellent compensation package and benefits.

Please send resume in complete confidence to:

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## PROGRAMMER/ ANALYST CICS

Growing Florida corporation interested in finding experienced CICS/VS Programmer/Analyst. If you are aggressive, a self starter and full of ideas we are interested in talking to you. Candidates should have a strong working knowledge of ALC and ANS COBOL. This position is in sunny Orlando, Florida. This data processing environment is a DOS/VS operating system using CICS/VS, on an Itel A/S 6-3 (5 mag.) with a state wide growing TP network of over 400 terminals. In addition to group insurance we offer a profit sharing and retirement program. Send resume to Rod B. Pelzer, Programming Manager, Longwell Title Services, Inc., P.O. Box [illegible], Orlando, FL [illegible].

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Computer Science

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PROGRAMMER/ANALYST position available in Burroughs 6810/COBOL shop. Interesting applications using structured methodology in the field of air pollution control. Requires degree plus 3 years experience in software development. Located in the heart of the Highland Lakes of central Texas. Send resume to: Janell Robertson, Personnel Director, Texas Air Control Board, 6330 Highway 290 East, Austin, TX 78723.

AA/EOE

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Should be a college graduate, preferably with a computer science or business related degree. Must have 1-2 years experience in one or more of the following: EDP Auditing, Auditing/Accounting, Data Processing. Should be familiar with structure and operation of a data processing organization.

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We have openings in various locations, including San Diego, the San Francisco Bay Area, Los Angeles and New York.

To be considered for our San Diego positions, call **David Eisenhuer at (714) 453-1040 extension 464.** For our other openings, contact **Ursula Shepard** by calling **TOLL FREE (800) 227-1030.** Or send your resume to **National Advanced Systems, 3145 Porter Drive, Palo Alto, CA 94304.** We are an affirmative action/equal opportunity employer m/f/h.

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# COMPUTER SYSTEMS DESIGNER

We are looking for a Senior Systems Designer to assume responsibility for design and development of State-Of-The-Art Interactive Programs for a major public exhibition on information and the computer (Scheduled to open in early 1982). Programs accessible to naive users will include interactive retrieval, simulations, imaging, mapping, and other graphics using standard as well as special hardware and IO devices.

The incumbent will be responsible for hiring and sub-contracting programming services to develop new software, and to adapt existing programs and data. Duties will include: A) Establishing programming and operational standards; B) Monitoring system and module development; C) Building schedules; D) Testing and recovery procedures; E) Documentation. Strong emphasis on ease of use and other human factor considerations. Should be able to work closely with all groups, including exhibit designers, vendors, agencies and creative consultants.

Applicants should have 3-5 years recent experience managing a complete program development cycle, including contract negotiation. Should also have 5-10 years recent experience in the development and maintenance of interactive programs, including graphics. Applicants should be familiar with a broad range of languages, operating systems, access methods and applications, and should possess a good knowledge of networking and some acquaintance with current work in artificial intelligence. Salary open.

If you are qualified for this position, send resume and salary history to:

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DATA PROCESSING

## SYSTEMS ANALYST EMORY UNIVERSITY HOSPITAL ATLANTA, GEORGIA

Recent promotions have created be opening on the Applications Development staff of Emory University Hospital. Projects will be in the areas of Patient Care, Ancillary Support, Finance and Administration, and will involve use of CICS and DL/I in a VM environment. Our minimum requirements include: a degree in Information Science, Business Administration or related field or equivalent experience, 4 years DP experience, 3 with DB/DC systems, good knowledge of CICS and DL/I, demonstrated design and implementation abilities and 2 years programming experience to include heavy experience in ANS COBOL.

For more information call or write K. Pleasants, Employment Center, Emory University, Personnel Department, Atlanta, GA 30322, 404-329-7011.

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Western NY financial institution needs savvy programmer with min. 1 yr. COBOL. Sophisticated IBM 370/ OS/ MVS/JES 3 installation offers several openings in many depts. from data base to EDP audit. Excellent opply. Salary $18,000. Contact Pam Siegel.

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# MIS PROFESSIONALS/ DATA PROCESSING PROFESSIONALS

Atlas Copco, a world leader in compressed air equipment is consolidating and relocating its North American Management Information Systems division to Holyoke, Massachusetts, with a charter to design and implement on-line transaction based applications systems throughout the entire organization. Our rapid growth demands that our information systems be state of the art. As part of our expanding MIS staff, you will be utilizing the leading edge in hardware and software as most recently affirmed by our commitment to the extensive use of color and graphics in all applications throughout our organization. That's why we can offer you a challenging career where your contributions are recognized and rewarded and an environment designed to keep you in the forefront of technology.

We are looking for aggressive, professionals with thorough knowledge and experience of IBM-OS operating systems with demonstrated achievement in one or several applications areas, with on-line transaction based software desirable. We require:

## SYSTEMS ANALYST

Responsible for user liaison, systems specifications and design and project control of on line manufacturer/financial and/or marketing systems, at least 6 years' experience in feasibility studies, design and implementation of DB/DC applications. Must have good knowledge of Data Base design, COBOL and project control techniques. Strong verbal and written communication skills a must.

## SENIOR PROGRAMMER/ANALYST

Responsibilities involve design, development and programming of on-line manufacturing and distribution systems. Applicants are required to have a minimum of 4 years' solid experience with IBM OS COBOL structured techniques. Familiarity with VSAM, CMS, DMS, CICS, OS/JCL utilities and experience with any on line data base systems: IMS TOTAL, IOMS.

## PROGRAMMER ANALYST

Responsible for analysis and programming of on line commercial systems/applications. Applicants are required to have a minimum of 2 years experience with IBM OS COBOL. Familiarity with CSAM, CMS, DS, CICS, OS/JCL and utilities. Experience with data base technology a plus.

## SYSTEMS PROGRAMMER

Responsibilities include planning, installation and support of operating systems and program products, applicants are required to have solid experience background in HAL, JCL, systems support utilities or either TSO or CMS and one of the following:

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Faculty opening in Computer Science beginning August 30th for individual to teach all levels of Data Processing courses, including COBOL & Assembly with either DOS/VSE or OS/JCL experience. Educational support equipment with IBM 4331 and PDP 11/45 Systems. Master's or Bachelor's in appropriate discipline with multiple years of DP experience required. 1 year of teaching or business experience required. Salary up to $22,000 for 10 months, commensurate with credentials and experience. Respond in writing to: Sussex County Community College, Personnel Services, Dept. DS, P.O. Box 5, Newton, N.J. 07860.

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**MVS/CICS SYSTEMS PROGRAMMER**
A minimum of six months of MVS systems programming experience required. Knowledge of CICS and 3600 Software a definite plus.

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4-5 years of experience in a large IBM shop with time spent doing both programming and analysis. Four years of COBOL and some Assembler language essential. Banking experience preferred, particularly in Item Processing.

**PROGRAMMERS**
At least one year of experience in a large scale IBM shop using OS, COBOL.

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(2 positions)
2-4 years of managerial experience in a large scale IBM DP shop, concentrating on an item or check processing function. Thorough knowledge of proof/encoding and large scale reader/sorter equipment essential. Software experience including CPCS or equivalent desirable.

**PROGRAMMER/ANALYSTS**
At least three years of experience in a large scale IBM shop using OS, COBOL. Must have programming and analysis experience.

Excellent salary offered, commensurate with experience. Comprehensive company-paid benefits package, training programs, and excellent career growth opportunity exists in our innovative organization. For interview, send resume to:

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M+B

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To plan and direct all activities of the systems programming section.

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To direct the activities related to the administration of the computerized data base, including definition, organization, protection, documentation, long term requirements and operational guidelines. Incumbent will work closely with the managers of systems programming and applications programming.

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To develop, modify and maintain Vendor-supplied software and general purpose programs and utilities.

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## MANAGER SCIENTIFIC APPLICATIONS

[illegible]

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[illegible]

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[illegible]

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Data Processing

# SYSTEM CONVERSION NEW SHOP

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2-5 years programming experience, IBM DOS or VS, thorough knowledge of COBOL and some interactive programming tools required.

## COMPUTER ANALYST

5 years COBOL programming experience required. Degree in computer science, DOS/VS and understanding of corporate accounting helpful.

## COMPUTER OPERATOR

1-2 years IBM DOS/VS operator experience required.

Our company offers excellent benefits, including stock savings and educational assistance. For immediate consideration, please send salary requirements and resume. No phone calls please.

**Employment Manager**

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# Arizona

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In this position, you'll define the requirements of data processing services users and design, specify and implement systems. Your duties will also include involvement in long-range planning and feasibility studies.

A BS degree is preferred, although equivalent experience in general accounting, manufacturing control, or industrial engineering will be considered. Strong interpersonal skills are required; experience with data base management or distributed processing is a plus.

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Minimum of 4 years experience which must include 2 years of programming in ALC or COBOL.

**PROGRAMMER ANALYST**

Minimum of 2 years experience in programming with ALC or COBOL languages.

**PROGRAMMER**

BS/BA degree in Computer Science, Accounting, Math or any 4 year degree with a minimum of 12 hours of Computer Science (plus 2 years work experience).

**Minimum Requirements:**

BS, BA degree in Math, Computer Science, Accounting, or any 4 year degree with a minimum of 12 semester hours in computer science or equivalent work experience. The individual must program in COBOL or ALC languages. Hardware oriented with large IBM and AMDAHL. Software oriented in OS/MVS, IDMS, LEXICON, TSO, CICS.

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TYMSHARE INC.
10231 Bubb Road
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Attn: Pat / Diana

TYMSHARE
EQUIPMENT SUPPORT DIVISION

**SENIOR ANALYST/ DATA BASE SPECIALIST**

The National Center for Higher Education Management Systems (NCHEMS) is seeking a full-time Senior Analyst/Data Base Specialist for its Information for Management Program. Responsibilities include: defining, design, and documenting data bases; developing edit and verification procedures; working with others to analyze problems and formulate, implement, and verify computer solutions; and supporting project staff in the development of data bases. Qualifications include: at least three years experience in the design and development of postal-address research bases and programming in FORTRAN or COBOL; skill in writing technical documentation and in managing project staff; demonstrated knowledge of common statistical procedures and techniques; familiarity with higher education management/administrative terminology; and a baccalaureate degree. Experience with HP 3000 computer system preferred. Starting salary range: $23,000 to $26,000, plus excellent benefits. For complete position description, and/or to submit resumes, write Director of Personnel, NCHEMS, P.O. Drawer P, Boulder, CO 80302. For full and timely consideration, APPLICATIONS SHOULD BE RECEIVED BY MONDAY, SEPTEMBER 5, 1983.

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Excellent opportunity with a growing DP staff in a rapidly expanding corporation. The successful candidate must have a minimum of 3 years COBOL and 1 year ALC language experience in an IBM 370 DOS/VS environment. Retail systems experience a definite plus. Excellent salary and benefits coupled with a friendly and modern environment makes this position a natural for the career minded. Company will pay all traveling relocation expenses. Call or send resume to:

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DATA PROCESSING

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Minimum requirements of this high-visibility position are a 4 year degree, preferably in computer science/business or equivalent job experience of at least 3 years, ideally in a hospital environment.

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If you feel you meet these qualifications and are looking for a career with a progressive, innovative communications company, kindly send your resume in confidence, specifying salary history and requirements, to:

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Several years of experience in the following areas are essential:

- Design and management of integrated information systems data base.
- Familiarity with a variety of commercial report generators and graphics packages.

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We offer a comprehensive benefits package and an excellent salary commensurate with your background. Send your resume in confidence to CW Box 2370, 375 Cochituate Rd., Rte. 30, Framingham, MA. 01701.

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# Corning Community College Senior Programmer/Analyst

Applications are now being accepted for a one year position at Senior Programmer/Analyst. Duties include programmer of computer programs and analysis of various information processing procedures and their adaption to electronic data processing. Work is performed in a state-of-the-art computer center. Position requirements: Minimum three (3) years progressive experience using COBOL preferably on DEC System 10 or 20. Experience in non-profit organization payroll and financial systems a plus. Salary $17,000 TO $20,000 depending on qualifications with extensive benefit package.

Interested candidates should submit detailed resume by AUGUST 25, 1980 to:

Director of Personnel
Corning Community College
Corning, New York 14830

Corning Community College is an Equal Opportunity Employer.

# SAN FRANCISCO PROGRAMMER ANALYSTS

If you are a Programmer Analyst with TANDEM or other minicomputer programming experience and are interested in a terrific job in San Francisco, then call Jim Stewart at (415) 781-5810 to get more details on these exciting opportunities.

If you are unable to call this week, send Jim your resume at Data Architects, Inc., Francisco Bay Office Park, 1750 Montgomery Street, San Francisco, Calif. 94111. We are an equal opportunity employer, M/F.

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Atlantic States, a national recruiting firm is searching for EDP specialists at all experience levels with diverse systems background. Many openings nationwide. For selective handling, without pressure, mail your resume to **Jim Reed, Atlantic States Personnel, P.O. Box 8828, Savannah, Ga. 31412. Fees Paid.**

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American Electric Power, one of the leading energy suppliers to the United States' heartland, consists of eight operating electric power companies serving more than seven million people from Michigan to Virginia. Our Service Corporation provides both the parent and operating companies with management, professional and technical assistance in planning, engineering, construction supervision and other fields.

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We are currently looking for:

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You should have a college degree (or equivalent) and 3-5 years' COBOL experience. A background in payroll/personnel a plus.

### Programmers
We currently have a number of career opportunities available for Programmers who will be involved with accounting applications. A college degree (or equivalent) required. COBOL experience desirable.

### Systems Programmer
Qualified candidates should have a college degree (or equivalent) and systems programming experience in at least one of the following areas: MVS/operating systems, JES-2, TCAM/CICS performance/hardware monitoring.

We offer salaries commensurate with experience and education and a comprehensive benefits package (including relocation assistance).

For prompt consideration, please forward your resume, including salary history and requirements in confidence to: Mr. J. E. Bagnoli, **Dept.-CW**

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***SPC provides a common carrier telecommunications systems linking over 80 metropolitan areas. Our Coast-to-Coast network of microwave relay, satellite and switching systems provides voice, data and facsimile transmission services to the Business and Residential Communities.***

Your major responsibility will include directing a staff to provide medium-to-long range network designs that meets business plans and recommend and review alternatives to these plans. Your staff will also provide functional specifications for automated switch network design programs which will perform traffic forecasting, trunk group sizing, port, multiplex, radio route forecast and economic analysis, as well as provide standards for network design and traffic engineering including network structure, grade of service, traffic routing and overload strategies.

Position requires 5-7 years "hands-on" experience in communication network design and analysis to include a minimum of 1 year in a managerial position. Bachelor's degree required with higher or additional degrees desirable in Engineering, Operations Research/Mathematics, Economics or Telecommunications Management.

The rewards are extremely attractive. Your professionalism will be challenged — and recognized. Compensation is excellent.

**For immediate consideration please send resume to, or contact Harry Speltz, SPCommunications, One Adrian Court, P.O. Box 974, Burlingame, CA 94010, (415) 692-5600, Ext. 2233. An equal opportunity employer M/F. Individuals only apply.**

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SYSTEMS ENGINEERING LABORATORIES is a vigorously growing manufacturer of state-of-the-art 32-bit mini-computer used in high-performance real-time applications. The following career opportunities are available due to SYSTEMS tremendous growth in a sophisticated technological environment.

## SUPERVISOR OF COMPILER DEVELOPMENT

Position will carry responsibility for the implementation of all corporate language implementations, including FORTRAN, COBOL, PASCAL, BASIC. Supervisory and planning ability is required. The successful candidate should have built two or more complete language products including all documentation. In this Senior position, the candidate will participate in new product definition in an engineering organization, and interface with the marketing organization to supply data for the corporate product planning and merchandising functions.

## COMPILER DEVELOPMENT STAFF MEMBERS

Individuals selected will have experience in coding, testing, and developing compilers and language products. These positions will offer the opportunity to provide technical leadership as the in-house consultant in compiler development.

## SOFTWARE SUPPORT ANALYST

This position involves troubleshooting software problems and assisting customers in installing new software packages. The successful candidate will have experience in identifying software design problems or misapplications of software on both the operating system and application level. Background in real-time operating systems is a requirement. The ability to interface with both customers and development engineering is an absolute necessity.

## SOFTWARE TECHNICAL WRITER

Dynamic, growing software writing group needs a highly-motivated software writer with background in operating systems, communications, data base management, and/or a language such as ASSEMBLER, FORTRAN, MARY2, PASCAL or COBOL. As an integral member of a product programming team in the Software R&D organization, you will be responsible for producing reference manuals, user's guides, technical manuals, pocket cards, and other literature for that product. You will have the support of the software writing group and in-house word processing, art, and printing departments in this capacity. Substantial writing samples are required. Excellent opportunity for individual with 4 or more years experience in computer-related technical writing who is seeking responsibility and challenge.

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# Systems Design Engineers

Our Division, a recognized leader in the development and manufacture of highly sophisticated telecommunications components and systems for the world's banks and security exchanges, requires several capable, talented computer professionals.

Qualified applicants will possess a minimum of 5 years in-depth experience working with mini and micro computer based terminal systems and Assembly language coding. A detailed knowledge of software/hardware and data communications technologies would be extremely helpful.

Working within our Engineering and Development department, you will become involved with the definition and functional specifications of our next generation of terminal system products. Will participate in software/hardware evaluation and selection, product planning and proposal writing. Excellent communications skills, both oral and written, are essential for effective interfacing with all areas of Engineering and Development to insure the coordination of all projects required to bring the new product to the marketplace

If you have previous experience working on development projects at the design level, and are interested in participating in broad, system level design projects, we can offer you a wide range of opportunities that are fully commensurate with your background and level of experience, and a generous program of employee benefits.

Qualified applicants should forward resume with salary history and requirements, in confidence, to: Mr. Dan Romanello, Bunker Ramo Information Systems, Trumbull Industrial Park, Trumbull, CT 06609. An equal opportunity employer m/f.

BUNKER RAMO **INFORMATION SYSTEMS**

# COMPUTER PROGRAMMER

## Construction Industry

Dynamic Industrial Constructors, a mechanical construction company, has an immediate need for a Computer Programmer with RPG experience for their office in New Orleans. Other computer language experience would be helpful.

Qualified candidate will work on IBM 36 equipment after completing a 5 week study course in basic IBM languages. Responsibilities will include technical programming in the following areas: costing, planning, scheduling, and estimating. Construction industry experience a plus.

DYCON offers a competitive salary structure, comprehensive company benefits and a generous relocation package. For immediate consideration, please send your resume to:

Chris Fite
Dynamic Industrial Constructors
DYCON
P.O. Box 10662
Jefferson, LA 70181
(504) 833-6720

# Systems Programmers

Norwich-Eaton Pharmaceuticals, with headquarters in Norwich, New York, operates a state-of-the-art processing facility and teleprocessing network using a 4 Mb IBM 370/158 AP. We currently operate under VM/370, VS1, CICS, and IMS. Continued technological growth in our data processing activities necessitates the addition of experienced systems programmers.

Prospective candidates should have at least three years experience in IMS and CICS on an IBM System 370/158 or larger computer. Additional experience in MVS, SNA, OS/VS1 and VM/370 is desirable.

Norwich-Eaton Pharmaceuticals is the worldwide pharmaceutical division of a Fortune 500 corporation. These challenging positions combined with our location, a small but complete community in upstate New York, offer excellent opportunities to maximize one's professional and personal goals.

We offer a competitive employment package including paid relocation, flexiable work hours and company paid medical and dental insurance.

If you'd like to know more call Mr. Morgan, collect at 607-335-3429, no agencies, please, between 8-5 E.D.T. weekdays prior to August 29 or write c/o Personnel Department.

**Norwich-Eaton Pharmaceuticals**
Division MortonNorwich
17-27 Eaton Avenue Norwich, New York 13815

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Assistant and Associate Professor positions available Fall, 1980.

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EMPLOYER: The Commission employs a small, skilled professional staff of ten persons, who are exempted from the personnel system of the State of Indiana. The Commission has its own PDP 11/70 system which it manages and which supports both word and data processing. RESPONSIBILITIES: Full responsibility for managing the PDP 11/70, negotiating with hardware and software vendors, technical assistance to other members of the staff, and shared responsibility for programming of new systems. DESIRABLE QUALIFICATIONS: Practical experience with word and data processing systems. Programming skills in COBOL and either FORTRAN or BASIC. Practical experience in managing a medium scale hardware/software system, including acquaintance with procedures for preventive maintenance, system generation, updating, patching, and backup. A degree in either computer science or business administration is preferred. TERMS OF EMPLOYMENT: Open and competitive with attractive fringe benefits. APPLICATION INFORMATION: Closing date is September 5, 1980. Send nominations and applications to Wayne Kreshing, Indiana Commission for Higher Education, 143 West Market Street, Indianapolis, Indiana 46204. Affirmative Action Employer

# PROGRAMMER/ANALYST

Stewart-Warner Corporation, world leader in automotive instrumentation and lubrication equipment, has an outstanding get-ahead opportunity in manufacturing systems development at our Chicago headquarters location.

We require that you be a high school graduate, with 3 to 5 years of heavy programming experience. You will know BAL and/or COBOL, plus IBM 370/DOS-VS. You must also know JCL. CICS experience will be a plus.

You will receive an excellent salary, complete benefit package, including paid overtime, divisional bonus, tuition reimbursement, company paid insurance and much more. An excellent opportunity - please send resume including experience and salary history to:

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Deadline - August 29, 1980.

Inquire - State Center Community College District, PERSONNEL COMMISSION, 1525 E. Weldon, Fresno, CA 93704. Phone 209/226-0720.

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One to three years' programming experience with COBOL required, preferably in an OS installation. Previous experience with and utilization of an Administrative or Business computing system, preferably in an educational environment. Prefer knowledge of and/or experience with a Data Communication System (CICS). Ability to work well with people in varied organizational relationships. Ability to articulate well both orally and through written communication with University Administrative Data Processing Center users. Prefer knowledge of and/or experience with a Data Base Management System. Minimum attainment of a Bachelor's degree or equivalent professional experience. Willingness to work other than normal work day. Starting salary will be commensurate with experience. Resume by August 25, 1980 to Data Processing Center, 180 Whitmore Administration Bldg., UNIVERSITY OF MASSACHUSETTS, Amherst, MA 01003. The University is an Affirmative Action/Equal Opportunity Employer.

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## NCR CIF

800 mil South Florida Bank Holding Co. is seeking programmer with at least one year experience with CIF, B or C series. Focis experience a plus. Data center, with on line programming environment, located in desirable suburban area. Call Mr. Baron or Mr. Berryman, (305) 667-1146

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## DATA PROCESSING
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- Sale and distribution of feed, seed, fertilizer, and petroleum products.
- Grain marketing.

We are located in a pleasant, thriving Midwestern community of about 75,000 people. Two universities and a diversified mix of manufacturing and financial enterprises contribute to the intellectual and economic vitality of the town and the surrounding area.

The data processing division supports two large on-line systems as well as a number of traditional batch applications. At present, we are engaged in several large projects in Inventory, Marketing, and Financial areas of the business.

Candidates should have:

1. Prefer four-year college degree with emphasis in business, data processing, or equivalent.
2. At least two years' experience in systems development.

Experience in a large-scale Honeywell environment or with Honeywell Level 6 minicomputers is a definite plus, but not essential. If this opportunity sounds appealing, send a resume to:

**Manager, Personnel Administration**
**GROWMARK, Inc.**
**1701 Towanda Avenue**
**Bloomington, Illinois 61701**

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## HOUSTON

**• DATA BASE ADMIN to $40K**

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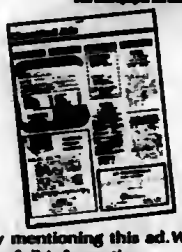

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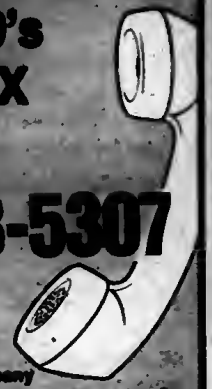

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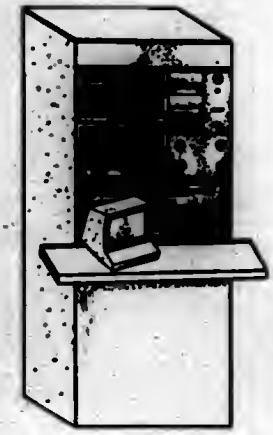

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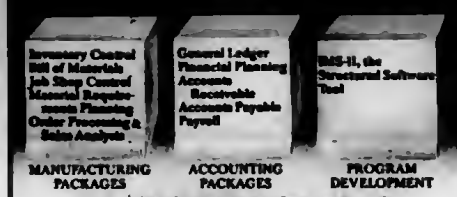


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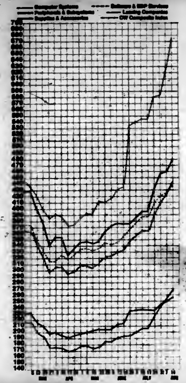



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## Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 13, 1980

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

| EXCH | | 1979-80 RANGE (1) | CLOSE AUG 13 1980 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| | **COMPUTER SYSTEMS** | | | | |
| A | AMDAHL CORP | 15- 42 | 27 1/8 | +8 3/8 | +14.3 |
| B | BURROUGHS CORP | 60- 80 | 70 1/8 | +0 7/8 | +9.0 |
| O | COMPUTER AUTOMATION | 3- 26 | 24 | +1 | +4.3 |
| B | CONTROL DATA CORP | 20- 66 | 48 1/3 | +3 1/2 | +9.0 |
| O | CRAY RESEARCH INC | 30- 74 | 73 1/5 | +6 3/4 | +10.0 |
| B | DATA GENERAL CORP | 44- 84 | 48 3/8 | +3 3/4 | +3.0 |
| B | DATAPOINT CORP | 44- 70 | 48 1/2 | +3 1/3 | +5.3 |
| B | DIGITAL EQUIPMENT | 52- 87 | 84 7/8 | +6 1/8 | +7.7 |
| A | DECO INC | 6- 19 | 16 3/8 | + 7/8 | +5.6 |
| B | ELECTRONIC ASSOC. | 6- 15 | 11 | +1 3/8 | +10.3 |
| N | FOUR-PHASE SYSTEMS | 20- 40 | 24 3/8 | -2 3/8 | -9.7 |
| B | FOXBORO | 31- 36 | 37 1/2 | -3 7/8 | -9.7 |
| O | GENERAL AUTOMATION | 7- 19 | 7 7/8 | + 1/4 | +3.2 |
| O | GRI COMPUTER CORP | 1- 5 | 1/3 | 0 | 0.0 |
| B | HEWLETT-PACKARD CO | 46- 78 | 74 7/8 | + 3/8 | +0.5 |
| B | HONEYWELL INC | 65-101 | 95 1/8 | + 1/8 | +0.0 |
| N | IBM | 50- 79 | 66 3/4 | +1 1/8 | +1.7 |
| O | MAGNUSON COMP SYSTS | 20- 28 | 25 1/4 | +8 3/8 | +30.3 |
| N | MANAGEMENT ASSIST | 9- 21 | 18 7/8 | + 1/8 | +0.7 |
| O | MANUFACTURING DATA S | 22- 42 | 39 3/8 | 0 | 0.0 |
| O | MINI-COMPUTER SYST | 3- 8 | 5 1/5 | + 1/3 | +14.0 |
| O | MODULAR COMPUTER SYS | 3- 25 | 18 1/8 | + 7/8 | +4.7 |
| N | NCR | 52- 82 | 73 | +3 | +4.3 |
| B | PRIME COMPUTER INC | 19- 38 | 36 1/8 | -3 | -8.3 |
| B | PERKIN-ELMER | 26- 39 | 34 3/4 | +1 7/8 | +5.6 |
| B | SPERRY RAND | 42- 60 | 54 7/8 | +3 | +5.7 |
| A | SYSTEMS ENG. LABS | 11- 26 | 25 | + 1/8 | +1.0 |
| O | TANDEM COMPUTERS INC | 19- 62 | 40 1/5 | +1 5/8 | +2.9 |
| B | TEXAS INSTRUMENTS | 79-121 | 115 | +4 3/4 | +4.3 |
| A | WANG LABS. | 17- 51 | 46 7/8 | +2 1/8 | +4.8 |
| | **LEASING COMPANIES** | | | | |
| O | BROTHE FINANCIAL CP | 12- 26 | 20 | +1 3/8 | +30.1 |
| B | COMDISCO INC | 6- 17 | 14 1/2 | + 1/8 | +0.9 |
| B | COMMERCE GROUP CORP | 1- 3 | 1 1/8 | + 1/8 | +0.5 |
| B | COMPUTER INVSTRS GRP | 3- 4 | 3 5/8 | 0 | 0.0 |
| P | DATRONIC RENTAL | 2- 5 | 0 | 0 | 0.0 |
| A | DCL INC | 3- 8 | 3 1/8 | - 1/8 | -7.1 |
| N | DPF INC | 3- 13 | 7 7/8 | + 3/4 | +10.0 |
| N | ITEL | 1- 10 | 2 5/8 | 0 | 0.0 |
| O | LEASPAC CORP | 1- 2 | 3/4 | 0 | 0.0 |
| A | PIONEER TEX CORP | 3- 8 | 3 7/8 | 0 | 0.0 |
| B | RELIANCE GROUP INC | 24- 73 | 48 3/8 | +1 0/8 | +2.5 |
| B | U.S. LEASING | 13- 18 | 19 1/8 | +1 3/8 | +7.7 |
| | **SOFTWARE & EDP SERVICES** | | | | |
| O | ADVANCED COMP TECH | 1- 4 | 3 | - 1/8 | -4.0 |
| O | AMACOMP INC | 7- 16 | 10 5/8 | -1 | -8.7 |
| A | APPLIED DATA RES. | 6- 17 | 15 3/8 | -1 3/8 | -8.0 |
| B | AUTOMATIC DATA PROC. | 31- 48 | 40 | -1 1/3 | -3.1 |
| O | COMPUTER HORIZONS | 1- 8 | 2 3/4 | 0 | 0.0 |
| O | COMPUTER NETWORK | 4- 8 | 8 1/8 | - 3/8 | -5.7 |
| B | COMPUTER SCIENCES | 11- 28 | 24 1/8 | + 1/8 | +1.0 |
| O | COMPUTER TASK GROUP | 1- 19 | 13 1/5 | + 1/2 | +3.0 |
| O | COMPUTER USAGE | 2- 3 | 8 7/8 | + 3/8 | +8.3 |
| O | COMPUT AUTO REP SVC | 4- 10 | 8 1/8 | + 1/8 | +0.7 |
| O | COMSHARE | 11- 25 | 19 | - 1/4 | -1.0 |
| C | CULLINANE CORP | 10- 40 | 40 | +8 1/8 | +8.4 |
| O | DATA DIMENSIONS INC | 1- 8 | 1 3/4 | 0 | 0.0 |
| O | DATATAB | 1- 4 | 1 1/8 | + 1/8 | +12.0 |
| O | DSI CORP | 4- 8 | 5 1/8 | + 1/8 | +2.0 |
| N | ELECTRONIC DATA SYST | 16- 31 | 25 1/8 | +1 1/2 | +6.5 |
| O | INFORMATICS INC | 3- 22 | 19 1/8 | +3 1/8 | +20.0 |
| O | INSYTE CORP | 1- 5 | 2 1/8 | + 1/8 | +6.3 |
| O | IPS COMPUTER MARKETS | 2- 4 | 3 | 0 | 0.0 |
| O | KEANE ASSOCIATES | 3- 9 | 4 3/8 | - 1/4 | -5.0 |
| O | KEYDATA CORP | 3- 8 | 3 1/8 | - 1/8 | -5.3 |
| A | LOGICON | 13- 26 | 58 | + 1/8 | +0.3 |
| O | MATHEMATICA INC | 3- 10 | 15 1/4 | - 1/4 | -1.9 |
| O | NATIONAL DATA CORP | 10- 22 | 25 3/8 | -5 | -8.0 |
| B | PLANNING RESEARCH | 3- 9 | 7 1/8 | - 3/8 | -4.9 |
| O | PROGRAMMING & SYS | 1- 1 | 3/8 | + | +0.0 |
| O | RAPIDATA INC | 4- 8 | 8 3/8 | +2 3/8 | +46.0 |
| O | REYNOLDS & REYNOLD | 23- 34 | 22 3/4 | -1 1/2 | -6.1 |
| O | ATSC INC | 6- 11 | 10 3/4 | 0 | 0.0 |
| O | SCIENTIFIC COMPUTERS | 4- 17 | 17 | + 1/2 | +3.0 |
| N | TYMSHARE INC | 34- 66 | 48 3/8 | +3 1/2 | +9.9 |
| A | URS SYSTEMS | 6- 15 | 13 7/8 | 0 | 0.0 |
| N | WYLY CORP | 4- 12 | 13 3/8 | +2 1/2 | +18.2 |
| | **PERIPHERALS & SUBSYSTEMS** | | | | |
| B | AM INTERNATIONAL | 13- 25 | 18 1/2 | - 3/8 | -2.1 |
| N | AMPEX CORP | 14- 28 | 24 | - 1/8 | -2.0 |
| A | ANDERSEN JACOBSON | 6- 17 | 14 1/4 | + 7/8 | +6.0 |
| B | APPLIED DIG DATA SYS | 6- 15 | 10 5/8 | + 3/8 | +8.0 |
| O | AUTO-TROL TECHNOLOGY | 16- 50 | 40 | - 3/8 | -1.0 |
| O | BEEHIVE INT'L | 2- 14 | 15 7/8 | + 1/8 | +8.0 |
| A | BOLT, BERANEK & NEW | 13- 27 | 27 5/8 | +1 1/5 | +5.7 |
| B | BUNKER-RAMO | 17- 50 | 35 1/8 | +3 | +9.0 |
| O | CAMBRIDGE MEMORIES | 1- 4 | 3 1/3 | +1 0/8 | +46.0 |
| B | CENTRONICS DATA COMP | 20- 25 | 40 1/8 | +5 5/8 | +16.3 |
| A | CETEC CORP | 3- 7 | 6 1/8 | + 1/8 | +1.0 |
| C | COMPUTER DEVICES INC | 3- 4 | 8 | - 3/8 | -4.0 |
| O | COGNITRONICS | 1- 8 | 5 1/5 | + 1/8 | +3.3 |
| O | COMPUTER COMMUN. | 4- 10 | 8 1/8 | + 1/8 | +4.3 |
| O | COMPUTER CONSOLES | 4- 28 | 16 1/2 | -3 1/8 | -16.4 |
| O | COMPUTER TRANSCEIVER | 1- 4 | 8 1/8 | - 1/8 | -5.0 |
| N | COMPUTERVISION CORP | 24- 92 | 88 1/4 | +8 3/8 | +6.5 |
| N | CONRAC CORP | 13- 25 | 18 5/8 | +1 3/8 | +7.0 |
| A | DATA ACCESS SYSTEMS | 6- 17 | 16 7/8 | +1 1/2 | +9.7 |
| A | DATA PRODUCTS CORP | 11- 24 | 18 0/8 | +1 7/8 | +7.0 |
| O | DATUM INC | 2- 6 | 3 3/4 | - 1/8 | -3.0 |
| O | DECISION DATA COMPUT | 2- 8 | 2 3/8 | + 1/4 | +7.6 |
| D | DELTA DATA SYSTEMS | 1- 8 | 5 1/8 | 0 | 0.0 |
| B | DOCUMATION INC | 7- 27 | 20 1/4 | +2 3/8 | +13.0 |
| O | DATARAM CORP | 6- 17 | 11 1/4 | + 7/8 | +8.6 |
| P | ELECTRONIC M & M | 2- 7 | 6 | + 3/8 | +6.6 |
| O | EVANS & SUTHERLAND | 23- 50 | 50 1/2 | +8 | +19.0 |
| O | FABRI-TEK | 1- 6 | 3 7/8 | - 1/8 | -3.1 |
| O | GENERAL COMPUTER SYS | 1- 6 | 4 1/8 | + 3/8 | +10.0 |
| O | GENERAL DATACOMM IND | 12- 22 | 21 | 0 | 0.0 |
| O | GENERAL TERMINAL CP | 2- 6 | 3 5/8 | + 7/8 | +30.7 |
| B | HAZELTINE CORP | 13- 31 | 25 1/8 | +1 1/2 | +6.0 |
| B | HARRIS CORP | 28- 48 | 44 1/2 | + 1/4 | +0.6 |
| O | INFOREX INC | 1- 8 | 1 1/8 | + 1/8 | +12.5 |
| O | INFORMATION INTL INC | 3- 18 | 12 3/8 | + 3/8 | +3.3 |
| O | INTEL CORP | 48- 93 | 90 3/4 | +6 1/8 | +7.3 |
| O | INTERSIL | 13- 39 | 37 1/8 | - 3/4 | -2.0 |
| A | LUNDY ELECTRONICS | 4- 12 | 8 1/4 | +1 1/8 | +15.0 |
| O | MSI DATA CORP | 3- 11 | 10 | +1 3/4 | +21.3 |
| B | MEMOREX | 16- 34 | 15 1/8 | +1 1/8 | +8.0 |
| B | MOHAWK DATA SCI | 10- 21 | 20 7/8 | +1 1/4 | +6.3 |
| D | OMEX | 2- 10 | 8 1/3 | +1 | +15.0 |
| A | PARADYNE CORP | 13- 48 | 38 1/8 | + 1/8 | +0.3 |
| A | PENRIL CORP | 3- 10 | 10 3/8 | - 3/8 | -3.4 |
| O | RAMTEK CORP | 10- 17 | 13 1/8 | - 3/8 | -3.0 |
| O | RECOGNITION EQUIP | 3- 13 | 10 1/8 | + 1/4 | +2.0 |
| O | SCAN DATA | 1- 3 | 3 3/4 | - 0/8 | -18.1 |
| N | STORAGE TECHNOLOGY | 12- 31 | 18 3/8 | +1 1/2 | +9.2 |
| B | SYKES DATATRONICS | 16- 37 | 37 1/8 | +5 3/4 | +18.0 |
| O | T BAR INC | 16- 21 | 18 3/4 | -2 1/4 | -11.0 |
| A | TEC INC | 6- 8 | 8 | - 1/8 | -2.4 |
| N | TEKTRONIX INC | 43- 68 | 68 | +3 7/8 | +6.0 |
| B | TELEX | 3- 6 | 6 1/4 | + 1/8 | +0.2 |
| O | TESDATA SYSTEMS CP | 3- 26 | 9 3/8 | - 3/8 | -4.0 |
| O | TIMEPLEX INC | 7- 20 | 19 1/8 | +1 | +5.0 |
| O | WILTEK INC | 1- 6 | 5 | + 1/8 | +4.3 |
| | **SUPPLIES & ACCESSORIES** | | | | |
| A | AMERICAN BUS PRODS | 6- 15 | 15 7/8 | +1 3/8 | +21.0 |
| O | BALTIMORE BUS FORMS | 1- 5 | 3/4 | 0 | 0.0 |
| N | BARRY WRIGHT | 12- 26 | 23 3/8 | + 3/8 | +1.1 |
| O | CYBERMATICS INC | 1- 1 | 1 | 0 | 0.0 |
| B | DUPLEX PRODUCTS INC | 11- 18 | 13 7/8 | -1 1/8 | -7.3 |
| B | ENNIS BUS. FORMS | 13- 21 | 16 3/4 | - 1/8 | -0.7 |
| N | 3M COMPANY | 46- 60 | 57 3/4 | -1 | -1.7 |
| C | MOORE CORP LTD | 27- 34 | 25 7/8 | + 3/8 | +1.0 |
| B | NASHUA CORP | 20- 39 | 21 3/4 | +4 | +18.4 |
| O | STANDARD REGISTER | 22- 31 | 25 | +1 | +0.4 |
| A | TAB PRODUCTS CO | 12- 25 | 21 3/8 | +1 0/8 | +0.1 |
| B | WABASH MAGNETICS | 11- 18 | 18 | + 3/8 | +2.5 |
| N | WALLACE BUS FORMS | 29- 37 | 37 3/8 | +1 | +2.7 |

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